

ARMED FORCES

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**DECEMBER
1956**

Feature

**What Makes TAC
Ready Right Now?**

By General Weyland

ORIGINAL COPY 2
On the Cover

General O. P. Weyland, Commander of Tactical Air Command, is possibly the world's leading authority in the application of tactical air forces. Since he entered the Air Service in 1923, he has held virtually every important assignment associated with this country's tactical air forces. Under his guidance TAC has reached a level of major importance and power in the United States Air Force. It has led to a re-evaluation of the uses of tactical air. They include development of the incredibly potent mobile strike force capable of deploying swiftly to any area in the world a major or minor war might dictate.

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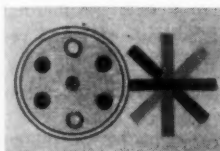


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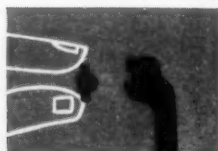
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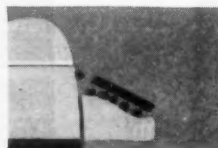
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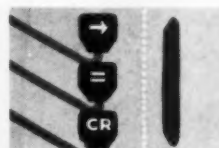
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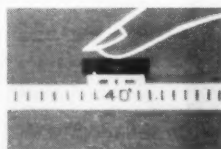
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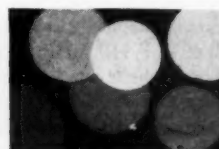
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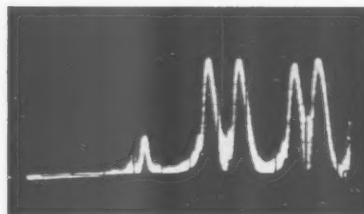
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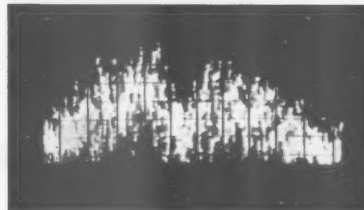


How you can "squeeze" 64 simultaneous messages into a single frequency

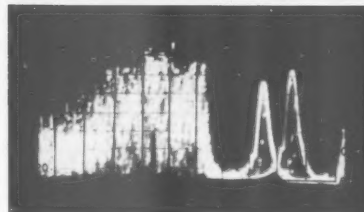
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ARMED FORCES MANAGEMENT

What Makes Tactical Air Command Ready Right Now?

TAC Tells its Commanders

What to do, but NOT

How to do it. Here's why . . .

THE WEAPONS systems of modern tactical air forces are based upon a swiftly changing technology and require the finest possible leadership and management to assure positive and responsive control and coordination of manpower and materiel resources.

In fulfilling the broad mission of Tactical Air Command to "Organize, equip, train and administer forces, assigned or attached, to participate in tactical air operations" on a world-wide basis, the Tactical Air Command must develop at all echelons of command individuals who are ready to implement the vital action expected of the Command when necessity dictates.

Tactical Air Command must be constantly alert and ready to deploy its forces at any given moment to meet aggressive action on a major scale. We must plan for the deployment and employment of units to operate independently within those areas of the world for which no other United States Air Force Commander has responsibility. TAC in a nutshell, is poised to participate as a major force in any full-scale war or to operate as the chief deterrent to small, peripheral wars.

Without essential command and control, assisted by adequate management tools, any complex machine or organization, no matter what its potential, becomes ineffective. This holds true with the Tactical Air Command the same as with any comparable size civilian organization. It is our responsibility then to provide this machine with leadership and management in the form of highly qualified commanders and staff officers who can effectively oper-

ate in any of the far-flung corners of the globe whether or not they remain in direct contact with their parent organization. This principle is not restricted to commanders and their key staff officers alone, but must apply to all personnel who are responsible to any degree for control and supervision of personnel and equipment.

Although the responsibility for effective management of our fighting resources applies to all levels, the commander sets the pace. He is and will always remain the key manager within his sphere of influence. Therefore, he must have the responsibility and authority to command effectively plus the ability to develop efficient and effective utilization of the funds, materiel, and manpower resources allotted to him. Because of the enormity of the task confronting him and the span of command, the commander has not the time to become involved in routine and detail, but must concentrate his attention on major operations and decisions. Through recognition of problems and the establishment of sound management policies for guidance, the commander can strengthen and improve the position which makes the Air Force the effective fighting machine it is today.

Sometimes in large organizations the higher headquarters or office will unintentionally, in the interest of accomplishing objectives, usurp the prerogatives and responsibilities of lower commanders by prescribing their duties and operations in too great detail. Though the need for higher level directives and guidance is essential, those which shackle the subordinate commander by telling him not only what to do but how to do it, will reduce efficiency and effectiveness and violate fundamental principles of leadership. In 1954, Tactical Air Command established a positive policy to delegate to lower echelon commanders the greatest possible degree of authority and responsibility. To accomplish this goal, action was taken to reduce, and in many cases to eliminate those directives which usurped the authority and various prerogatives of a commander. In addition, a wholesale reduction in the number of letters, regulations, memorandums, etc., was made.

Inasmuch as all of the documents which adversely affected a commander's capability to command did not originate in TAC Headquarters nor in its subordinate organizations, it was necessary to seek aid from the Department of the Air Forces. This aid was readily and enthusiastically given. A Manpower Management Review Team was appointed, consisting of representatives from USAF and TAC, and studied base administration within the command. As a result of their findings, a number of boards and committees were discontinued, thirty-five reports were eliminated, an equal number simplified, and a large number of directives were revised in an interest of simplification and clarity. The most im-



By General O. P. Weyland

portant achievement, however, was the return of an inestimable number of valuable manhours to commanders for application to their primary roles.

In addition to the command aspects and capabilities of individuals, TAC, in order to carry out its responsibilities as a powerful deterrent to major or minor aggression anywhere in the world, requires a dynamic, streamlined organization. TAC must be ready to go when needed and requires a highly mobile and flexible logistics system geared to the support of this mission.

In line with this requirement, the concept of world-wide utilization and support of tactical air units has been developed to a high degree among the various TAC units and a specialized headquarters in the Nineteenth Air Force is in being to deploy and control these forces in combat. Additional proposals have been made to the Air Staff which will further improve TAC's growing capability in this field of world-wide operations. These proposals are receiving favorable reactions in many quarters and should be finalized in the not too distant future.

An inherent characteristic of tactical air forces is flexibility. This coupled with the mobility necessitated by TAC's new operational concept further emphasizes the need that the wing-base structure not saddle the commander with the

responsibility for real estate and house keeping in addition to his primary tactical mission. To rectify this situation, a new organization has been developed. This new organization envisions a typical TAC base being occupied by an Air Division Headquarters, two combat wings and an Air Base Wing. A tactical wing will be composed of four tactical squadrons and a Periodic Maintenance Squadron. This additional tactical squadron does not increase the aircraft inventory as each squadron now will possess eighteen (18) aircraft in place of the twenty-five (25) formerly authorized. It becomes very apparent that under this concept a tactical commander is concerned primarily with his tactical mission and consequently is able to better attain and maintain a high state of combat readiness. He has been relieved of all base housekeeping functions such as Base Housing, Dependent Schools, Base Supply, and Commissaries, to name a few. He has in the true sense once again become a tactical or "operational" commander; while on the other hand, the Air Base Wing Commander has been delegated all the base functions.

We believe this organization will more adequately fulfill TAC's obligation to the USAF and the American taxpayer by materially providing more mobile and combat ready striking forces. In terms of air power, this organization, which augments the capabilities main-

tained by SAC and ADC, presents a very definite world-wide deterrent to aggression.

The new organization is in better alignment with the principles of sound management. In keeping with these principles, the new wings are being organized with the limited resources currently allocated to this command. Under this concept all personnel will know exactly what they are to do, and why they are to do it. Overlapping responsibilities will be eliminated by the clear-cut missions of the tactical commander and the air base commander. Further, both commanders will have the tools, capabilities and prerogatives to accomplish their missions. They have also been provided with general broad outlines of their positions and missions, but have not been burdened with minute details, SOP's and directives pinpointing the methods they will employ to accomplish these assigned tasks.

In recent years we have seen aircraft performance forge ahead while the development of vital support capabilities has lagged behind. The great challenge to industry, as well as management, is not only to provide compatible equipment, special airfield facilities, and essential maintenance skills, but to have all of these available at the time the weapon rolls off the production line. In Tactical Air Command this problem is rendered all the more difficult by a highly diversified mission and the variety of weapon systems required to fulfill it. In TAC we have tactical bombers, fighter-bombers, day-fighters, reconnaissance aircraft and guided missiles, as well as support aircraft, such as heavy and medium troop carriers, air refueling tankers, helicopters, and assault planes plus a complicated communication control system.

Changing problems of such magnitude and complexity cannot be solved in detail overnight. Within the last twelve months, a number of steps have been taken which promise well for the future. We are rapidly developing portable maintenance capabilities in our tactical squadrons and field maintenance units, and we have begun to establish special supply accounts to support each of our mobile combat

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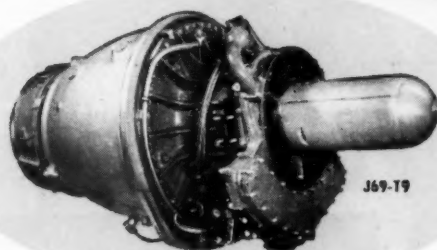
units. In addition, our base mechanization program, designed to convert from manual to mechanized methods in supply operations is well advanced.

In the long run, I am confident that our logistic difficulties can be surmounted through competent management and the resourcefulness of the industry. I am much more concerned about our manpower problems—our ability to procure and retain the technical skills necessary to keep our aircraft and associated equipment combat-ready at all times. In this area, industry is a competitor, and personnel management, however enlightened, has a staggering problem when the personnel themselves choose to move on to the "greener pastures" offered by industry. To reduce the losses, the Congress, the Department of Defense, and the Air Staff have adopted a number of measures calculated to make service careers more attractive to our younger officers and airmen. In Tactical Air Command a vigorous reenlistment drive has produced highly encouraging results, and we have recently launched an equally vigorous program to retain career-minded officers now serving obligated tours. Other plans are in the making which, I feel sure, will increase stability, improve morale, and generate a healthy spirit of competition between our tactical units.

In summary, these are the principal objectives of management within Tactical Air Command: (1) An organizational structure that will provide the mobility and flexibility required by our assigned mission; (2) Commanders with ability and a high sense of responsibility; (3) Support equipment that will enhance mobility; and (4) Personnel who can be trained into highly technical specialists and induced to make a career of the Air Force.

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The signals which are part of the Remington Rand Kardex system provide quick visual controls on continuous preventive maintenance operations. They indicate each inspection made, deficiencies observed and still uncorrected, equipment considered due for salvage, excess items, etc. Twin Cities Arsenal can instantly determine the maintenance status of any machine or structure.



How Top-notch Preventive Maintenance Cuts Cost at Twin Cities Arsenal . . .

by **Lt. Col. E. H. Hilsman**

*U.S. Army Ordnance Corps
Commanding Officer*

and **L. E. Teberg**

*Chief, Operations Review Division,
Twin Cities Arsenal,
Minneapolis, Minnesota*

AN ORDNANCE officer learns early in his career that good preventive maintenance is a must for all types of Ordnance equipment. He also learns that preventive maintenance to be effective must be scheduled and controlled in such a manner that equipment receives proper lubrication, or other maintenance measures, before a costly failure develops which may require parts replacement or overhaul.

The Ordnance Corps has saved the Government countless billions of dollars by reducing parts and overhaul costs, and by extending

the life of high-cost end items of equipment. In periods of active combat, the incentive to accomplish effective preventive maintenance is immeasurably increased by the realization that dependable equipment may spell the difference between life and death for his fellow soldiers.

Small wonder, then, that one of our principal fields of interest upon assignment to command of Twin Cities Arsenal was the preventive maintenance program. Although the incentive for survival was lacking, the Government's investment in plant and equipment, at today's values, exceeded 110 million dollars, for which we were given responsibility as a function of command.

To our dismay, it was soon apparent that no deliberate, planned program of preventive maintenance was in use; schedules and controls

were not in existence for either the maintenance to be performed or the inspections required to assure compliance. Responsibility for maintenance inspections and appraisal of performance was divided among several members of our staff—all competent people, but each had a multitude of other important duties which diverted their attention. The fact that the preventive maintenance program was suffering was evident from personal observation, reports from our staff, and inspections made by higher echelons of command.

Upon reaching these conclusions, an appraisal of action necessary to correct the situation led to the centralization of responsibility for all preventive maintenance under one individual, with concurrent assignment to his control of a minimum number of assistants. Needless to

say, the individual was hand-picked for the qualities of initiative and resourcefulness, technical competence, and personal appreciation of the importance of the program. An immediate understanding was reached with regard to the importance of the elements of scheduling, control, and inspection, but the development of the means of accomplishment was left to his discretion. The result of his efforts are attested to by the almost immediate improvement in inspection reports, and the comments of inspectors from higher echelons of command that maintenance has greatly improved in the past year.

The story of how this was accomplished belongs to the individual responsible for the program, and Mr. L. E. Teberg's account follows. Mr. Teberg was initially Chief of the Maintenance Division, created for the purposes detailed above, and is now Chief of the Operations Review Division, which includes responsibility for maintenance, process and product engineering.

Teberg's Story

Defense against production blockades can well be considered a part of the nation's overall program of defense against aggression. Especially when the production in question is munitions for our armed forces.

To engineers charged with the responsibility of keeping production equipment operating at maximum efficiency, one of the major defenses against disrupted production is a sound, integrated program of preventive maintenance.

Our activities at Twin Cities Arsenal embrace the operations of three companies under government contracts: Federal Cartridge Corporation, manufacturing small arms cartridges; Donovan, Inc., 155 mm artillery shells; and Minneapolis-Moline Company, 105 mm shells. It is our task not only to see that the munitions comply with the standards demanded in the contracts, but also to see that production levels are maintained to meet delivery dates. Both these functions require a high level of efficiency from the men, women and machines that produce the munitions, plus critical inspection procedures.

The physical plant of the Arsenal includes some 350 buildings and structures in which are housed approximately 7,650 production machines, 500 pieces of mobile equipment, and all the non-productive yet essential elements to an establishment of this size. Until the latter part of 1955, the staff upon whom we depended to keep this plant operating at its maximum efficiency was greatly handicapped by the lack of any defined program of preventive maintenance.

Prior to that time, the records of our productive equipment consisted of huge sheets, 24" x 36", on which were listed, in columnar form, the machines with such descriptive information as manufacturer, function, size, cost, location, etc. About 100 machines were listed on each sheet, and the 70-odd sheets were stapled together in groups according to the buildings in which the machines were located. These lists were basically intended for production analysis purposes, and were in a form entirely

unsuitable for maintenance evaluation and records.

No provision was made on these sheets for entries of maintenance activities, repairs or inspections. Even if there had been spaces provided for such data the bulk and disorganized format of the lists would have rendered them quite ineffectual for maintenance records. Nor was it possible to establish any periodic inspection schedules that could be followed up and entered.

When we decided that an inspection of a machine or structure was necessary we had to head up an inspection order and send it to the department involved. Upon the return of the order with a notation that the inspection had been made, we had no means of certifying that, if any deficiencies had been discovered, they had been corrected.

We had no central, readily available source of reference to determine when, if ever, a machine had been inspected, or how frequently. Actual repairs upon the machines after they had broken down, were handled by the contractors through requisitions under the provisions of the contracts.

Set Up Controls

To correct this situation, our staff, with the aid of Remington Rand's systems technicians, began to set up a Kardex control system on July 1, 1955. In six weeks the physical format of the system was completed. In adopting this control system we had two basic objectives: 1) to establish a practical preventive maintenance program that would reduce mechanical failures and work stoppages; and 2) to prevent costly damages to government property caused by negligence or lack of accessible factual records.

Now, each piece of equipment—productive, non-productive, mobile, etc.—every building and structure is represented by its individual Kardex record form, filed in a visible Kardex pocket. Sixty to 70 of these records are retained in a Kardex slide, with space available for the insertion of additional records in the slides when and if required. Seventeen slides fill one Kardex cabinet, and nine of these units house our entire maintenance



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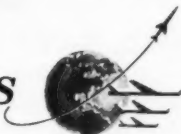
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control records, all occupying an area of about nine feet wide, 2½ feet deep and three feet high.

These sets of Kardlok record forms, numbering close to 9,000 are segregated into groups according to our specific requirements—productive machines costing \$500 or more, costing less than \$500, by building location, by either group number or RW (Remington-Winchester) number; equipment: mobile; administrative; engineering; material handling; hospital; kitchen; buildings and structures. This breakdown enables us to locate and identify any record or unit of equipment in a matter of seconds.

The set of record forms for each piece of equipment in the Arsenal consists of a buff Kardlok card which remains in its Kardex pocket permanently. This card is headed Preventive Maintenance or Surveillance Inspection Record, and carries detailed information on the machine it represents—and description, manufacturer, model, serial number, year of manufacture, function, size, weight, voltage, location, cost and various code numbers. Space is provided for entries of inspection date, findings, follow-up, and inspector's initials.

This card and a buff Kardlok visible insert are placed in the Kardex pocket. The insert serves a double purpose: to provide a visible index for that record in the Kardex slide, and a monthly division scale to use with the color-coded, movable Graph-A-Matic signals. We insert crimped signals numbered 1, 2, 3, 4 and up to indicate each inspection made, flagged on the index insert according to month. A red signal denotes a deficiency was observed when the inspection was made, and is still uncorrected. A green signal is used to identify equipment or a structure that is considered due for salvage, so far depreciated that a large expenditure for maintenance is not warranted. The green signal is also used when the item is classified as excess, and need no longer be maintained.

Thus, with this basic card and the color code signals we can instantly determine the maintenance status of any machine or structure in our facility. We can pre-schedule periodic inspections according to

the specific requirements of the unit; we can see at a glance what deficiencies have not been corrected; we can check items due to be discarded for salvage; and we can avoid duplication of inspection activities.

In addition to the buff Kardlok form and its visible index insert, we have a blue Kardex form which is inserted on the back of the immediately preceding pocket, thus facing the buff card which it supplements. This blue card, headed Inspector's Report, is removed and given to the inspector when an inspection is to be made. It carries a description of the machine, its location and code numbers.

Available Now!
Bound Volumes of
Armed Forces Management

Again this year offered at cost handsome bound volumes of the previous year's issues! Finished with a red leatherette cover, Volume II, October, 1955, to September, 1956, issues, is available for \$10 by writing Armed Forces Management, 208 S. Second St., Rockford, Ill. Orders for last year's Volume I exceeded supply, so we suggest you mail your order now.

Following the inspection, he fills in his report date, findings, etc., and returns the card to the Kardex clerk. Any deficiencies noted during that inspection are called to the attention of the foreman in charge of that equipment group either by word of mouth or, if the deficiency is serious, by written order of the command. The Kardex clerk replaces this blue card in its proper place in the file after posting the entries it bears over to the buff card and inserting the applicable signals.

When the inspector receives that same blue card at a later date for another inspection, he has the complete maintenance history of the machine at hand, which is invaluable in providing a check on its operation. Recurring faults are easily spotted and corrective measures instituted. The maintenance history is thus recorded on both cards, and is a permanent record in the Kardex file, readily accessible at all times.

Since the installation of the Kardex control system, we have

extended its application to another phase of inspection, and are finding it an extremely valuable addition to the basic objectives of the system. During the past several years, production operations have been considerably reduced because fewer munitions contracts are being awarded to the operating contractors at the Arsenal. This means we have fewer employees here, and less machines are in operation. By order of the Defense Department, machines not being used are partially disassembled, given proper protective treatment against corrosion and damage, and placed on a reserve or standby status, corresponding to the Navy's "Mothball fleet."

This layaway procedure requires three inspections:

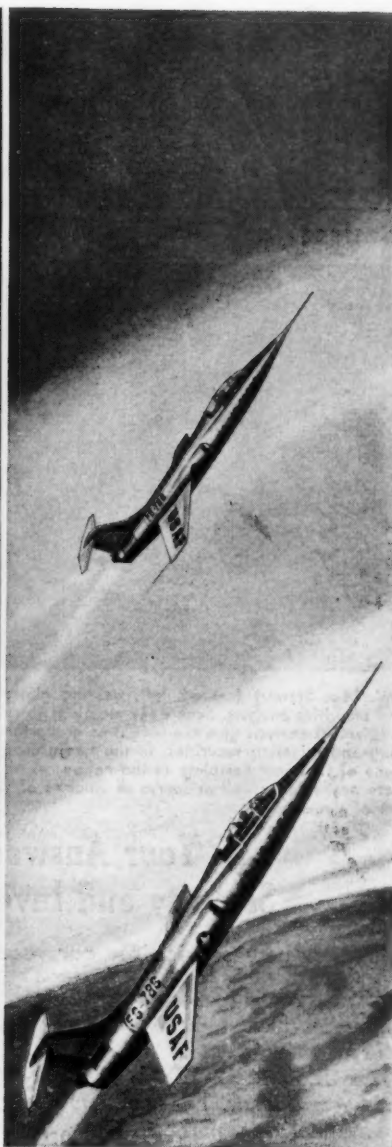
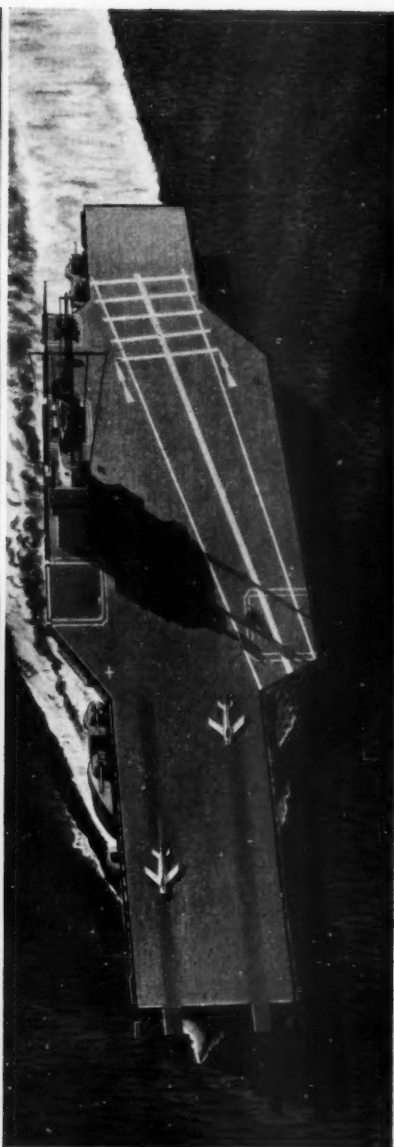
- 1) Before the layaway, to verify the machine's operating condition.
- 2) At the time of the dismantling, to insure effective precautionary measures and storage of the dismantled components.
- 3) Cycle inspections during the layaway period.

Regulations require that before each machine is accepted for layaway, a member of the Ordnance Corps staff must be present at its inspection. Because of reduced personnel, this is physically impossible at present. However, we can and do approve acceptance of a group of like machines on the basis of an inspection of two or three machines in the group.

The machines inspected are so designated in our Kardex system by a brown code signal and numbers of like machines in that group are posted to these cards. The numbers of the machines inspected in the group are posted to the cards of machines not inspected. This cross reference provides ready identification of machines on which acceptance was based.

This we can instantly determine which specific machines did not have an officially supervised inspection prior to acceptance for layaway, and an order can be issued at a later time when such an inspection is feasible.

Despite its relatively short history, our Kardex Preventive Maintenance System has met every requirement of our basic objectives, has proven an invaluable source of



ON LAND... ON SEA... IN THE AIR...

RCA electronic equipment, systems and components represent high performance and reliability.

Electronics play a primary role in our nation's defense. The success of missions, the detection and pursuit of enemies, the navigation of ships and planes, the maintenance of communications—these and a hundred other func-

tions underscore the vital necessity for both high performance and complete reliability.

To all services RCA has come to mean advanced thinking on present problems.

Its broad approach to military electronics and its firm insistence upon reliability of performance, contribute to efficiency of operation and safety of personnel.



DEFENSE ELECTRONIC PRODUCTS

RADIO CORPORATION of AMERICA

CAMDEN, N. J.

vital reference information, and has demonstrated its flexibility in reaching out beyond its original purpose to embrace additional applications.

A definite factor in the bulwark

of our defenses is that program of preventive maintenance which strives toward an uninterrupted flow of production. And only practical, well-integrated control methods can implement such a program to attain its greatest efficiency.

Business and Finance



W. Mac Stewart (seated, left, wearing glasses) presides at a regular meeting of his staff of securities analysts. Such daily meetings to review and discuss recommendations prepared by individual analysts give the weight of group thinking and experience to the vital job of selecting and rejecting securities. In the background is one corner of Hamilton's research library, one of the most complete in the nation, where complete records on thousands of companies are available, as well as scores of volumes of various statistics needed to reach sound investment decisions.

Your Answer to Today's Security and Investment Problems

Another new service for our readers!

The growing number of reader inquiries have indicated the need for a new section in ARMED FORCES MANAGEMENT Magazine—a Financial Page. Service personnel are perhaps the most security-conscious and investment-conscious single segment of the population. Yet, because of their duties, they have less contact than the average businessman with financial matters, and have more need of objective financial advice.

To help solve this problem, ARMED FORCES MANAGEMENT Magazine has contracted with one of the nation's foremost investment authorities, Walter Mac Stewart, to serve as Financial Editor. In addition to a monthly financial roundup and a searching look at the nation's economic picture, Mr. Stewart will be happy to answer individual questions by mail. This valuable new page will make its appearance in the next issue.

Mr. Stewart is well qualified by

both training and experience to offer sound investment advice. He is Vice President in Charge of Research, Hamilton Management Corporation. As Research Director of Hamilton he heads a staff of skilled analysts responsible for the selection and supervision of approximately \$50,000,000 worth of securities owned by the investors in Hamilton Funds. In addition to this mutual fund management responsibility, his Division handles the securities research for Hamilton's Investment Advisory Division, which serves a number of wealthy clients with personal portfolio analysis and continuing investment advice, involving several million dollars in investments. The excellent results accomplished by Hamilton Funds for its investors is evidence of the efficiency of Mac Stewart and his staff.

Stewart received his PhD in mathematics and his Master of Philosophy in Mathematical Statis-

tics at the University of Wisconsin. He had further advanced studies at the same university. Prior to World War II he occupied the Mathematics and Statistics chair at the University of Wyoming, and served as an economic statistician for the U.S. Government. During the war he first entered the Finance Dept., served with the 82nd and 102nd Airborne Divisions, and later instructed in mathematics at Virginia Polytechnic Institute in the A.S.T.P. His last army assignment was as a Research Assistant in the highly secret Manhattan District (now A.E.C.). Following the war Stewart entered the investment field as a research analyst, and in 1949 became Chief Analyst for a large Stock Exchange Member Firm. In 1952 he joined the Hamilton staff as Director of Research, a position he has held since. In early 1956 he became Vice President of the Corporation. Many of Stewart's writings have appeared in journals in both the statistics and investment fields, and he is recognized as an outstanding analyst. ARMED FORCES MANAGEMENT Magazine is proud to add a man of Mr. Stewart's stature to our staff, and feels that he will offer invaluable service to our readers.

Hercules Passes Test

The C-130 Hercules—the Air Force's first propjet-propelled combat transport—has demonstrated its ability to deliver troops and supplies by parachute into combat zones.

The propjet transport, which became an operational unit of the United States Air Force in December, has completed simulated "war-time" tests at Pope Air Force Base, N.C.

Air Force pilots and crew members and Army paratroopers and supply forces were impressed with the new cargo-troop air carrier during the six weeks of aerial maneuvers. Officials of Lockheed Aircraft Corporation, builder of the plane, said they were proud that the versatile aircraft performed the atomic age tactical air duties for which it was designed.

Eighty-six missions were flown. A total of 160 tons of supplies, 315 dummies, and 485 paratroopers were dropped.

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Personnel Opportunities

In answer to the many requests submitted to our questionnaire, ARMED FORCES MANAGEMENT is pleased to announce that effective with this issue a professional vacancy list will be published each month. We invite the listing of any position, GS-9 or above. This cut-off point was established on the basis that GS-9 and above positions entail as a major portion of the duties management responsibilities. Space limitations in this Department will preclude so-called "wholesale listings", however we shall do our best each month. Comments on how ARMED FORCES MANAGEMENT can serve you are welcomed from Civilian Personnel Officers.

Title and Location Grade Remarks

Abilene AFB, Tex.

Architectural Engineer	GS-11	
Engineering Equipment Operating Foreman	WF-8	\$2.57 ph
General Maintenance Inspector	WB-15	\$2.06 ph
Electrical Plumbing Estimator	WB-15	\$2.06 ph
Mason	WB-15	\$2.06 ph

Ardmore AFB, Okla.

Supervisory Accountant	GS-9	3 vac.
Safety Administrator	GS-9	

Air Force Cambridge Research Center, Mass.

Systems Operation Test Analyst	GS-14	
Electronic Systems Analyst	GS-13	3 vac.
Physicist (General)	GS-12	
Electronic Engineer	GS-11	2 vac.
Electronic Scientist	GS-11	
A/C Stress Analysis Engineer	GS-11	
Electronic Engineer (General)	GS-9	
Electronic Scientist (General)	GS-9	

Castle AFB, Calif.

Electrical Engineer	GS-11	
Mechanical Engineer	GS-11	
Budget Officer	GS-9	

Ent AFB, Colo.

Management Analyst	GS-13	
Civil Engineer (Planning)	GS-12	2 vac.
Construction Management Engineer (Buildings)	GS-11	
Organization & Methods Examiner	GS-11	
Really Assistant	GS-9	
Administrative Assistant (Installations Management)	GS-9	

Air Force Finance Center, Colo.

Systems Accountant	GS-12	
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Holloman AFB, N.Mex.

General Engineer (Research & Dev.)	GS-13	
Supv. General Engineer	GS-13	
Electronic Scientist	GS-13	
Electronic Engineer	GS-12	
Electronic Engineer	GS-9	
Aeronautical Engineer	GS-12	
Aeronautical Engineer	GS-11	
Mechanical Engineer	GS-12	
Mechanical Engineer	GS-11	
Mechanical Engineer	GS-9	
General Engineer	GS-12	
General Engineer (Forecast Programming)	GS-11	
Civil Engineer (Facilities Planning)	GS-12	
Civil Engineer	GS-11	
Administrative Officer (Tech. Info.)	GS-11	
Supv. Publications Editor (Physical Science and Engineering)	GS-11	
Management Analyst	GS-9	
Industrial Security Inspector	GS-9	2 vac.

Langley AFB, Va.

Systems Accountant	GS-12	2 vac.
Cost Accountant	GS-9	
Mechanical Engineer	GS-9	
Electrical Engineer	GS-9	

McClellan AFB, Calif.

Recreation Leader (General)	GS-9	
Recreation Leader (Sports)	GS-9	

Norton AFB, Calif.

Mathematical Statistician	GS-13	
Electronic Engineer (Wire Comm.)	GS-11	
Supv. Cost Accountant	GS-11	
Electronic Engineer (Radio)	GS-11	
Electronic Engineer (Radio)	GS-11	2 vac.
Electrical Engineer	GS-9	
Industrial Engineer	GS-9	6 vac.
Mechanical Engineer	GS-9	
Systems Programmer	GS-9	2 vac.

Title and Location

Grade Remarks

HEADQUARTERS FIFTH ARMY

Civilian Personnel Office (5001), Headquarters Fifth Army, 1660 E. Hyde Park Blvd., Chicago 15, Ill.

Architectural Engineer	GS-11
Electronics Engineer (Telephone)	GS-11
Mechanical Engineer (Heating)	GS-11
General Engineer (Maintenance)	GS-10

THE SACRAMENTO DISTRICT CORPS OF ENGINEERS

1209 Eighth Street, Wright Building Sacramento, Calif.

Agricultural Appraiser	GS-10 and GS-11
Civil, Hydraulic, Electrical, Structural Engineers	GS-5-GS-11
Engineering Draftsman and Engineering Aids	GS-3-GS-7
Geologists	GS-5-GS-9

Robins AFB, Ga.

Operations Research Analyst	GS-12	
Medical Officer (Occupational Medicine)	GS-12	
Electronics Engineer (Wire Comm.)	GS-12	
Missile Inspector	GS-12	
Systems Analyst & Electronic Equip. Programmer	GS-11	2 vac.
Missile Inspector	GS-11	5 vac.
Systems Development Analyst (Electronic Processing Equip.)	GS-11	
Analytical Statistician	GS-9	7 vac.
Electronic Processing Equip. Programmer	GS-9	
Mechanical Engineer (Tools and Shop Equip.)	GS-9	2 vac.
Electronic Engineer (Wire Comm.)	GS-9	
Mechanical Engineer (Heating and Ventilating)	GS-9	
Mechanical Engineer (Gen.)	GS-9	
Industrial Engineer	GS-9	2 vac.
Aeronautical Engineer	GS-9	
Industrial Engineer (Shop Methods and Procedures)	GS-9	5 vac.

Westover AFB, Mass.

General Engineer (Program & Planning)	GS-11
General Engineer (Planning)	GS-9
Architectural Engineer	GS-9
Safety Engineer	GS-9
Supv. Gen. Engineer (Real Estate Facilities)	GS-9
Public Bldg. Superintendent	GS-9

Wilkins Air Force Station, Ohio

Supv. Industrial Engineer	GS-12	
Systems Development Analyst (Electronic Processing Equipment)	GS-12	
Electronic Processing Equip. Programmer	GS-9	2 vac.
Engineer, Architectural	GS-9	
Engineer, Mechanical	GS-9	
Production Standards Specialist	GS-9	2 vac.

Wright-Patterson AFB, Ohio

Systems Development Analyst	GS-13	
Actuary (Property)	GS-12	
Mechanical Engineer	GS-12	
Patent Advisor (Mechanical)	GS-12	
Production Specialist (Electronics)	GS-12	
Tabulation Project Planner	GS-12	
Accountant	GS-11	4 vac.
Actuary (Property)	GS-11	2 vac.
Budget Administrator	GS-11	
Liquid Fuel Facilities Engineer	GS-11	
Maintenance Officer (Policy)	GS-11	
Mechanical Engineer	GS-11	
Structural Engineer (Foundations)	GS-11	
Supv. Accounting Officer	GS-11	
Supply Officer (Procedures & Analysis)	GS-11	
Tabulation Project Planner	GS-11	
Visual Information Specialist (Exhibits)	GS-10	
Accountant	GS-9	
Analytical Statistician (Operations and Administration)	GS-9	
Contract Specialist	GS-9	
Mechanical Engineer	GS-9	2 vac.
Real Property Records Officer	GS-9	
Structural Engineer	GS-9	
Supv. Visual Information Specialist	GS-9	

Wright Air Development Center, Ohio

Aeronautical Research Engineer	GS-13	
Electrical Engineer	GS-13	
Power Plant Engineer	GS-13	
Supv. Aircraft Flutter & Vibration Engr.	GS-13	2 vac.
Supv. Dynamics Loads Engineer	GS-13	
Aerodynamic Development Engineer	GS-12	2 vac.
Aeronautical Development Engineer	GS-12	
Aeronautical Research, Development and Design Engineer	GS-12	
Aircraft Structural Development Engr.	GS-12	2 vac.
Electronic Engineer	GS-12	2 vac.
Electronic Scientist	GS-12	
General Engineer (Aero Medical Equip.)	GS-12	
General Engineer (Programming)	GS-12	
Research Physiologist	GS-12	2 vac.
Supv. General Engineer	GS-12	
Aircraft Design Engineer (Ejection Seats)	GS-11	
Aircraft Design Engineer (Integral Tanks)	GS-11	



By Lt. Col. G. L. Heaton
Wright Patterson AFB

SEATED around a large executive type conference table twenty-four men are completing the final phase of an effort to better solve complex problems.

The above situation could apply to many corporations, companies or industries in the United States today. In this case it applies to the United States Air Force, itself as large and complex as several combinations of "big business" in our present world.

The twenty-four men mentioned include nine Lt. Colonels, eleven Majors and four civil service employees. All were carefully selected for this training in the Advanced Logistics Course. Established by Headquarters USAF, this course is being presented by the Air Force Institute of Technology, with the assistance of the Ohio State University Research Foundation. The need for such a course has been felt for some time, particularly in the Air Materiel Command, the nerve center of the far-flung Air Force logistics system.

To say that the science of logistics is becoming more complex is an understatement. All the military services, in the days since World War II, have seen the introduction of new weapons systems, the support of which has become increasingly difficult. Today it is impossible for one human mind to comprehend all the components of any weapon system. It follows then that the management of these systems, the day-to-day business of being logistically prepared has also increased in complexity, proportionately to the weapons sys-

A New Approach To Air Force Logistics Management

tems themselves. The lack of qualified officers to carry on the logistics work has been brought about by several factors but the ones which prompted the establishment of this Advanced Logistics Course were (a) the apparent lag in logistics education as compared with the growth of logistics needs and (b) the need for new logistic concepts and doctrines.

It became clear during the early planning for this course that the foundation should be built on the approach that training offered be slanted to the wholesale aspect of logistics. Or, comparatively, on the plane of executive development programs so prevalent in industry today. This thought was maintained throughout the planning to develop the curriculum for the initial course. As a result of this thinking the course (six months in length) was divided into two sections, the educational or "classroom" work, and student research. Each section was approximately three months in length. The approach taken in the educational portion was that the student should be exposed, first of all, to those elements in which the logistician must operate. These include the Economics of Logistics from a national and international viewpoint, the Planning and Programming aspects from all levels down to and including a major air command, and the application of management and human relations principles to the logistician. These elements combine to furnish a foundation to the logistician, an area of basic guidance, certain

restrictions, a reason for operating.

Following the progression upward, it was felt that next should be offered a brief look into the realm of logistics, those facets which make up the whole. Here, the proximity of AMC proved invaluable, as the top experts in logistics fields were available for presentations and discussions. During this phase the student was presented, and through group discussion a thorough analysis was made of the basic concepts, philosophies and problem areas in Supply, Maintenance, Procurement, Transportation and Comptroller. In addition, the functions of specialized logistics areas, i.e., inventory control, distribution, requirements, quality control, and communications were covered. After completing the curriculum to this point it was hoped that the student would have a grasp of the scope of the logistics area, a knowledge of all logistics functions from the standpoint of an appreciation for the logisticians field of endeavor, and a glimpse of the exterior forces which must be considered in any logistics problem. The next step was to orient the students to an appreciation and understanding of the various techniques and tools that are available to assist in problem solving. Subjects such as linear Programming, Operations Analysis, Research Methodology and Research Management and Application are not new to the Air Force, but to slant these methods to logistic areas is a new approach. Here experts from the academic and industrial world passed on

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their experiences, attempting to illustrate application to the Air Force. This was very well received by the students, and a keen interest was shown in this regard.

The culmination of the course was the Research Phase. Students were divided into six teams and each team given a current Air Force logistics problem. In choosing the problems on which to work, prime consideration was given to those cutting across all facets of logistics, so students would not have only a supply problem or maintenance problem. The problem as stated to each group was put in its most simple form, thus giving a task to the students of redefining the problem, limiting the scope, so as to come up with a workable schedule to fit into the time and manpower allotted. The main purpose of the Research Phase was to give the students practical experience in applying the knowledge acquired during the classroom work. If a solution or technique were evolved during their work which would be of some benefit to the Air Force, so much the better, but this was a secondary consideration. The final reports have been received and it appears that some of the project teams have produced tangible results of benefit to the logistics system. The reports aroused great interest in AMC, while the Department of Defense and Headquarters USAF also evidenced additional interest, requesting a briefing on two projects. The Research Phase was particularly interesting from the standpoint that there were no restrictions on the individual teams as to whom they could see or where they could travel while performing their studies. Here was an ideal situation for research. No day-to-day operating problems to worry about, no telephones or normal paperwork to distract. This is admittedly not the situation which is encountered on the job, but is the best way to assimilate new techniques and apply them to arrive at solutions.

Based on experience gained to date, a tentative curriculum for the next course has been written. It incorporates several changes which were felt necessary. The length of the next course will be increased from six to nine months,

thus allowing additional subject materiel to be covered, expansion of other areas as required, together with the added advantage of conforming to the normal academic year of other Air Force schools.

The staff is very pleased with the results to date, both from the student standpoint and the interest shown by top management within the Air Force. The other services and private industry, facing some of the same difficulties, have also indicated interest in this work. It is considered that this school fills a void in the career development of a logistician as well as contributing to basic philosophies and doctrines within the area of logistics. These in turn will improve management of the complex USAF logistics system, creating better support for the U.S. Air Force and truly allowing more Air Force per dollar.

Air Force Cataloging Problem Unprecedented

Requirement for contractors to write descriptions of new Air Force supply items must be written into all possible contracts, Major General Frederick J. Dau, Air Materiel Command's Director of Supply, said recently.

The general stressed that the Air Force cataloging problem is unprecedented—that about 500 new items enter the Air Force supply system every calendar day, as new complex weapons are produced.

General Dau made these remarks in addressing 30 representatives of AMC's field installations attending a three-day cataloging conference.

General Dau added that cooperation of industry must be enlisted by the Air Force to get descriptions written properly after the requirement is in the contracts. The conference is stressing the importance of description writing as the beginning step in the cataloging process that supports materiel management. Already 400 major contracts provide for the contractor to write descriptions of new items.

In Korea, 1600 U.S. Army officers and enlisted men are engaged in furnishing training support for that country's 650,000 troops.

How would You Organize?

If you could wipe the slate clean and start over, how would you lay out the model organizational structure to move toward?

A new and fresh approach to the design of organizational structures is given in the monograph, "Organization—From Empiricism to Principle", by Colonel Leland B. Kuhre. In book format, the ideas are presented graphically with formulas applicable to any organization for human enterprise.

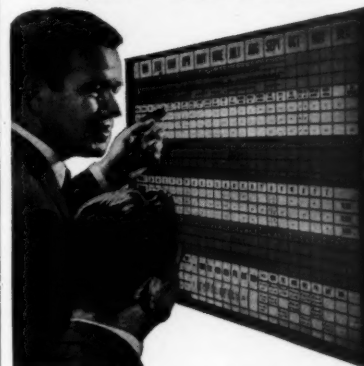
Starting from the mission to be accomplished, you can work out every position in its relativity to all other positions and to the whole. Then you will have an harmonious structure to induce a more spontaneous cooperation in people and to give greater productivity at less cost.

The form below will bring you this valuable aid for solving your problems in "how to organize".

The Academy of Organizational Science
Business Office, Dept. F
203 Greenlawn Dr., San Antonio 1, Tex.
Enclosed is \$_____ for _____
copies of "Organization—From Empiricism to Principle" @ \$2.50 each.

Name _____
Address _____
City & Zone _____ State _____

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Washington Management

Department of the Army. First deliveries of the Army's YH-32 Ram Jet helicopter have been made to the Army Aviation Test Board, Fort Rucker, Alabama, the Department of the Army announced recently. Four of the 12 YH-32s ordered by the Army and developed by Hiller Helicopters, Incorporated, Palo Alto, California, will undergo extensive field tests by the Army Aviation Test Board. Eight are scheduled for delivery to other field installations in the near future. The YH-32 is a two-place, two-blade single main rotor helicopter, powered by two Ram Jet engines developing approximately 40 pounds of thrust each. The engines weigh 12 pounds each, have no moving parts, and are CAA certified.

Department of the Air Force. The Air Force has announced that a new all-modern Aero-medical Center will be built at Brooks Air

Force Base, San Antonio, Texas. The \$8,800,000 center will house the USAF's School of Aviation Medicine, which has been dividing its operations between Randolph Air Force, Texas, and Gunter Air Force Base, Alabama.

Department of the Navy announced today that the Navy's new air-to-air guided missile, the SIDEWINDER, is now operational and is on board fleet units at sea. This missile is named after the fast-striking desert rattlesnake, the Sidewinder.

SIDEWINDER provides the fleet with a rugged, inexpensive weapon capable of operating against high-performance-type aircraft. Extensive testing and evaluation has demonstrated that SIDEWINDER is reliable and can destroy enemy fighters or bombers from sea level to altitudes of over 50,000 feet. The Navy explained that SIDEWINDER is basically a

defensive weapon and would be used to augment the protection of our men and ships at sea from attacks by enemy aircraft, thereby enhancing the position of the fleet in maintaining freedom of the seas for all nations. SIDEWINDER also will be employed in air defense of the continental United States.

Department of Defense. June 30th will mark the end of the special physician and dentist draft law which has been in effect since 1950. More than 30,000 have been called into the service during this period to supply the needs of the services. It is believed the regular draft will provide a sufficient number of doctors and dentists, however Congress will be asked to insert in the draft law a special provision to call them in time of need.

Department of the Army. Army commanders from the continental United States, and certain overseas commands, will meet with General Maxwell D. Taylor, Army Chief of Staff, at the Pentagon, December 3-5. Matters of current concern to the Army will be considered at the regular semi-annual session and will follow generally the pattern of those conferences held regularly in recent years.

Department of the Navy. The famed aircraft carrier ENTERPRISE—always the "Big E" to her crew—has been declared "unfit for further naval service" and will be sold for scrap purposes. Her name has been ordered stricken from the U. S. Naval Vessel Register, making the name available for a future ENTERPRISE. Sealed bids on the 20,000-ton carrier will be submitted to The Commandant of the Third Naval District, and the highest bidder above the Navy's appraised value—approximately \$1,000,000—will be awarded the ship. Launched on October 3, 1936, the CV-6 was the seventh Navy ship to bear the name ENTERPRISE.

Department of the Air Force. A recent announcement has been made that effective immediately,

New Loft Bombing Target Installed



Rear Admiral Robert F. Hickey, USN, sights in on the profile plotter of the new loft bombing target at the Naval Auxiliary Air Station, Fallon, Nev. The profile plotter is part of a recently installed electronic system which determines the accuracy of bombs dropped on the target by units in training. The new range is the first of its type for the exclusive use of fleet air units. With Admiral Hickey, who is Commander Fleet Air, Alameda, is Dr. N. E. Ward, Naval Ordnance Test Station, Inyokern, Calif. Captain J. H. Armstrong, USN, commands NAAS Fallon. (Official U.S. Navy Photo)

the Air Force would begin to recruit "six-months trainees" into combat and support units of the Air Reserve Program. Under the six-months training program, provided for by the Reserve Forces Act of 1955, the Air Force plans to recruit 2,500 trainees by July 1, 1957. It is expected that approximately 4,000 trainees will be recruited from July 1, 1957 to July 1, 1958.

Department of the Army. A new defense system developed by the Army Signal Corps to protect important underground military and civilian installations in the event of a surprise attack, has recently been announced. Officially designated the Radiological Defense Warning System, it is already at work at one major military headquarters. Installation is planned at important U. S. Air Force bases and will be used by Civil Defense authorities at strategic locations throughout the country. Cost of the system is relatively cheap with an estimated price of about \$500 when in full production.

United States Marine Corps. Lt. Gen. Ray A. Robinson, USMC, has assumed the post of Commanding General, Fleet Marine Force, Atlantic, with headquarters at Norfolk, Virginia. General Robinson has been Chief, Military Assistance Advisory Group, The Hague, Netherlands. General Alfred H. Noble, USMC, formerly CG FMF Atlantic, was promoted to four-star rank upon his retirement.

Department of the Navy (AFPS). A powerful sub-killing atomic depth charge, the Lulu, has been developed, according to Vice Admiral William V. Davis, Jr., Deputy Chief of Naval Operations for Air. The revolutionary weapon which can destroy a submarine "miles" from point of impact, recently was disclosed in Washington. The lethal range of the nuclear charge is measured in miles rather than in feet as in conventional weapons.

Department of the Air Force. Lieutenant General Frank H. Armstrong, Jr., USAF, recently pinned on an extra star and has assumed the post of Commander-in-Chief,

Alaskan Command. General Armstrong has headed the Air Force's Alaskan Air Command for the past three months. General Atkinson has taken command of the Air Defense Command with headquarters at Ent Air Force Base, Colorado.

National Guard Headquarters (AFPS). The National Guard has broken a 300-year tradition by swearing in its first woman member. Captain Norma Parsons, a nurse from Waterville, Maine, has joined the New York Air National Guard as a nursing staff member of the 106th Tactical Hospital, Floyd Bennett Field. The 84th Congress last summer authorized NG units to accept female members as nurses and medical specialists.

Army-Air Force Exchange Service. Major General Harlan C. Parks, USAF, has been named Chief of the Service effective the 7th of this month. General H. L. Peckham, USA, former chief is scheduled for retirement. The post alternates between the services.

Department of the Navy (AFPC). The Navy will spend \$23-million for launching equipment for a new frigate class vessel that will carry TERRIER guided missiles. Congress has authorized the construction of seven of the frigates in the Navy's 1957 shipbuilding program. The launchers, to be produced in a Navy-owned plant at Minneapolis, Minn., will be patterned after the systems used on the guided missile cruisers BOSTON and CANNON. The third guided missile cruiser the GALVESTON is presently undergoing extensive conversion at the Philadelphia Naval Base.

Department of the Army (AFPS). Officers attending senior service colleges in the future will be selected by a board now being formed, the Army has announced. The Senior Service College Selection Board, composed of graduates of the National War College, the Industrial College of the Armed Forces or the Army War College, will be appointed annually. Made up of two panels, the board normally will meet each November to make selections for the following year. One panel will name 38 prin-

cipal and 15 alternate nominees to the Industrial College of the Armed Forces. The second group will select 34 principals and 12 alternates for the National War College, and 179 principal and 50 alternate students for the Army War College. The second panel will also make selections, on the basis of invitational quotas for the Air War College, the Navy War College, British Imperial Defense College and the Canadian National Defense College.

Department of Defense. Authority to include a Canadian aircraft manufacturer (DeHavilland) in United States industrial mobilization planning has been approved by the Department of Defense. Tentative schedules of production in the event of an emergency, would reduce to a minimum the time normally consumed in contract negotiations.

Department of the Army. A global flight information service designed to meet the needs of Army aviators is being established by the Army Aviation Flight Information Division (AAFID) under the Chief Signal Officer. Field detachments are planned for Heidelberg, Germany; Tokyo, Japan; Fort Amador, Canal Zone; and Fort Richardson, Alaska. These will insure Army aviators high quality flight information in critical world areas. Army aviators previously used flight information furnished by other government agencies. This information, although, reliable, was incomplete since it did not contain vital data concerning Army, National Guard and some civil airfields suitable for Army air operations. The Jeppesen Airway Manual, official document of Army Flight Information, is distributed directly to over 3,500 Army, National Guard and Army Reserve aviators.

● In the two world wars the Red Cross Nursing Service was the recognized reserve for the Army Nurse Corps. It recruited 20,000 of the 25,000 nurses who served with the Army, Navy and Public Health Service during World War I, and 71,000 of the 77,800 who served in World War II.

Why Science Needs Modern Management Principles

And How They Should Be Used

ONE OF the encouraging phenomena of post-war times is the growing interest in government circles in the management function. Its development as a professional discipline,—the scrutiny of it as a subject of scientific interest, is indeed recent. This is all the more interesting when we consider the great antiquity of the management function in human affairs. It is exactly as old as organized human effort, and it therefore dates from the first time men gathered under a leader to fight their enemies. Their leader was the first manager. Alexander the Great was one of the most talented managers of all time if we judge by results. We are tempted to say it was a historical necessity that the managerial art was developed more extensively by military leaders than by any other class, certainly until recent times.

History is full of civilian managers, too, and there were many who equaled the most brilliant of military men. How else can historians explain the organizations of the splendid libraries at Alexandria. These libraries preserved the best of Hellenic thought and attracted scholars from the Mediterranean

world, and fostered research as well. It was managerial talent that held the Roman Empire together a thousand years; it was the administrators of Rome who preserved and handed to us the accumulated treasures of Western civilization, and the skill that has preserved civilization itself. Today it creates the proper climate for the growth of the arts and sciences, and it can stop that growth, when misguided, as easily as it can encourage it. If it were not for the line of managerial continuity that runs through all the matrix of history, you would not be reading this. You would be wearing the skin of an animal and perhaps sitting momentarily and apprehensively upon a stone inside a cave.

Now if the study of management can be expected to produce a science, there is an inverse relationship implicit in the study. There are, of course, two ways to relate these words:

1. Science of management

2. Management of science

No scientist and, indeed, no manager takes alarm at the first of these. The application of scientific principles to management cannot fail to improve management, we all say. Unfortunately, there is no such unanimity with respect to the second relationship. Some scientists do not agree that the application of managerial principles to science will result in anything good. They take this position in spite of the fact that these managerial principles were developed scientifically and in a sense they are denying the feed-back principle which is vital to scientific progress.

It is our thesis that management principles do apply to scientific research. Their application is required in today's complex of team research and interlocking programs. Good management is, indeed, a necessity if we expect to alleviate the shortage of scientific personnel in this country. Good management will obtain from every scientist the

best that is in him, because it will free him from labor he is not trained for and will give him maximum opportunity for creative work. This message will be welcome in government laboratories, especially. It is they who have the really difficult task of coordinating complex programs of great scope and cost. This paper is a kind of progress report on what has been done in this direction in one government laboratory of more than 600 employees. It will prove that a scientific staff can be oriented toward managerial attitudes. It will also stand as a testimonial to the inspiring level of teaching available in the Ordnance Management Engineering Training Program at the Rock Island Arsenal. The encouragement of the staff of OMETP is an indispensable ingredient of the success we have won so far.

Management of the Pitman-Dunn Laboratories

In case any skeptical scientist has read this far, we should make one basic principle clear at once. The management engineer does not propose to curtail the freedom of thought that is the priceless core of scientific progress. Today's preoccupation with developing good management is often interpreted to carry a threat to the traditional liberty of research scientists. Those creative moments which every scientist has experienced, some more frequently than others, are highly personal experiences. They are private affairs in the same sense that the creative work of an artist is private. They are a kind of self-communication that cannot tolerate external interference or control. In their presence, no one can do less than stand aside in silence.

One of the problems that management ought to study is how best to build into the schedules of our big laboratories a suitable opportunity for individual creative work. It is precisely the lack of good management that burdens our best re-

by E. R. RECHEL

Director, Chemistry Research,
Pitman-Dunn Laboratories Frankford Arsenal

searchers with a daily schedule that taxes them to the limit. Creativity, and how to induce it with favorable environmental and psychological influences, is already attracting the attention of psychologists. It is time some of our laboratories began applying some of the facts already known about creativity. It would also be useful for managers of laboratories to test experimentally some of the current theories about creativity.

The creative moment, however, occupies only a small fraction of the time of the most productive scientist. The greater part of his time, if he is part of a large research organization, is used in planning programs, carrying out experimental work, and evaluating progress. It is also our thesis that this work is such that, in the hands of experienced scientists, its demands on manpower can be estimated in advance, and it can be scheduled with fair accuracy. To support this view, we need look no further than the universities where planning of that kind occurs every time a thesis problem is assigned to a graduate student. The problem is chosen with respect to the student's ability, the amount of time he can devote to it, and the date by which he and his professors expect his degree to be conferred. In further support of this view, we mention the research foundations and government offices that support research by stipend or contract. In every case the support is based on a research proposal that offers a scale of effort, a scope of investigation, and an expected but not guaranteed result. It is not unusual for us to find that the scientist who objects to management controls in his department has been practicing them all the time.

Any research project can be taken apart to reveal those tasks that are repetitive and those that are non-repetitive, or unique. If the project is in an area new to the staff, there will be an early period of learning, of getting used to the behavior of materials and apparatus. The learning period is sometimes very long, perhaps a year or more, and we must recognize the inefficiency of placing research work in laboratories that have to go through a learning period. The government sometimes

does this purposely in order to increase the nation's research capacity, but it can seldom be justified on any other grounds.

In our laboratories every project is analyzed to separate the repetitive from the unique tasks. The repetitive, such as chemical analyses, ballistic measurements, and the like, are easily listed and estimated for time and cost. The unique, such as synthesizing a new organic compound, or designing a new projectile, are also estimated but with a larger margin of error. Our experience, however, enters strongly in the estimate, and through practice we are able to avoid the embarrassment of large balances at the end of the project, or of having to request additional funds. The typical budget will err on the high side as we find it more pleasant to return funds to the client along with our report, than to ask him for an additional sum to complete the work. If there was a large error in the original planning, we have found it possible to discover this fact long before the funds are exhausted, and to lay the situation before the client for decision either to increase his investment in the project, or to cancel it and conserve the remaining funds.

There are many repetitive tasks in our laboratories that have been standardized for the purpose of making estimates on complex investigations. The following examples are presented here to illustrate the range of difficulty they encompass:

Examples of Standardized Tasks in Pitman-Dunn Laboratories

	man-hours
Chemical Analysis of cartridge brass	0.20
Chemical Analysis of ordinary tool steel	0.13
Hardness survey of heat treated 75mm projectile	7.00
Tensile tests on 10 steel specimens	3.20
Velocity and pressure tests on cal. .50 ammunition	4.50
Infra-red analysis of smokeless powder	3.50
X-ray diffraction analysis of unknown magnesium compound	24.00
Microscopic identification of an explosive	12.00
Comparison of two fungi-cides in standard cultures	56.00

A good example of the analysis of a project is the search for a mirror that will not tarnish. Mirrors are used in optical instruments, and

if they tarnish, as they used to, the instrument becomes almost useless. Let us see how the planning would go.

The mirrors we are making are "front surface" mirrors, that is, the glass is coated with silver on the front surface instead of the back surface as in household mirrors. We must also have a mirror that reflects at least 90% of the light without any coloration, as would be the case with a copper mirror. In ordinary language, we want the brightest, most silvery looking mirror possible, and so far we have been talking only common sense. There is, of course, a technical equivalent of this talk which scientists use among themselves, but it would obscure rather than illuminate the discussion.

We have already narrowed the choice of metals for the mirror to a very few. Silver is out of the running because that is the metal we seek to replace. The metals left to us must be good reflectors and must not be colored. These can be selected without much trouble by looking up the reflectances of

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metals in scientific publications. The chemist now enters with his knowledge of chemical reactions, and he will immediately classify the metals into two groups, those he knows will oxidize or tarnish and those he thinks have a good chance of standing up in service. This narrows the choice still further, and I doubt that there would be more than six possibilities left, among them metals like aluminum, chromium, and perhaps platinum.

Twenty-five years ago it would have been impossible to put thin films of these metals directly on a piece of glass. At that time mirrors could be made only by chemically depositing the metal from a solution, and only silver could be used easily for mirror-making. Today we can make mirrors out of any metal by evaporating it in a heated vessel, and letting the vapor condense on the cold glass surface. In fact, this is the only method available for some of the metals we have chosen. So in our example we will have to assemble the high vacuum chamber necessary for the evaporation method. We will also need an optical instrument known as a spectrophotometer to measure the reflectance and the color distortion, if any. The third facility we will need is a series of chambers to test the resistance to tarnish of the experimental mirrors.

If the work is to be done by a well-equipped, diversified laboratory, all of these facilities will probably be available and no capital equipment costs will enter the planning. But if any of these is lacking, the purchase price that enters the budget must be supplemented not only by installation cost, but also by the cost of calibrating the item and learning to operate it. In this case, the spectrophotometric measurements could be safely contracted as separate work in another laboratory.

To make the experimental mirrors we will want a quantity of two-inch glass squares, polished optically flat on one side. These can be procured from optical supply houses at commercial rates. We can determine the number needed by noting that there are six metals to be tried, and that each will be evaporated under three different degrees of vacuum to determine

roughly the best degree of vacuum to use, and that each of the 18 kinds of mirror will be tested under three types of corrosive atmospheres. The choice of three conditions for evaporation and for tarnishing tests is purely arbitrary and is determined by experience with this kind of work. An inexperienced person, if put on this investigation without expert advice, would undoubtedly use a much more elaborate design of experiment. However, the modest plan which we are using will constitute an adequate "screening" type of investigation, one which covers the range of likely improvement without filling in the details. The number of mirrors we will make can be calculated from the fact that there are six metals, three degrees of vacuum, and three corrosive atmospheres. Thus, $6 \times 3 \times 3 = 54$ kinds of mirrors are to be compared. We ignore the spectrophotometer tests because they do not alter the samples and can be made on the same mirrors used for the tarnish tests. However, it is not good science to rely on one observation only, and we allow for replicates of the 54 combinations coming out of the experiment. In the light of experience, three would be the minimum number of replicates one would want to draw conclusions from, and five would be the maximum justifiable from the standpoint of added certainty of the results. If we choose three, the number of glass squares we

need is 162, and we can now proceed to calculate the time required to make and test the mirrors.

Drawing upon experience again, we use the standard time to make an evaporated mirror and multiply it by a suitable error factor, a number between one and two, to allow for unexpected difficulties with the new materials we are working with. These are the unique tasks and carry into the project the main element of risk. No such factor is used for the spectrophotometer as this is routine repetitive work. In the tarnishing tests we can estimate for the labor required to maintain the test chambers, and must add to this the time for periodic examination of the mirrors. The amount of tarnish, and whether it is acceptable can be measured on the spectrophotometer which will show the loss in reflectance.

If the project runs true to type, it will probably result in at least two kinds of mirror almost equally good, each outstanding in some respect. The choice of which to recommend will rest on factors outside the scope of the investigation, such as cost of manufacture and availability of material.

In this project the only unique tasks were making mirrors out of metals that had never before been used by the technician for that purpose. Every other operation was repetitive, routine work.

In our laboratories we make sure

Alaska Army Problems Discussed



Problems confronting the Army in Alaska were discussed at Fort Richardson recently when the commanders of major units met in their semi-annual conference with the Commanding General of United States Army, Alaska, Major General James F. Collins. Left to right: Colonel M. F. Cone, commanding officer, Fort Greely; Colonel James M. Moynahan, CO, Alaska General Depot; Colonel K. G. Pavey, CO, 9th Infantry Regiment; Lieutenant Colonel J. A. Findley, CO, Second Engineer Battalion; Lieutenant Colonel E. O. Carlson, executive officer, 68th Antiaircraft Artillery Group; Brigadier General John F. Ruggles, CO, Yukon Command; General Collins; Colonel Keith H. Ewbank, chief of staff; Lieutenant Colonel Bryan Gruver, Jr., CO, Wildwood Station; Lieutenant Colonel R. W. DeLancey, CO, 813th Engineer Battalion; Lieutenant Colonel T. A. Rodgers, CO, 4th AAA Group; Colonel T. A. Weadock, CO, Port of Whittier; Colonel E. L. Lerette, CO, 23rd Infantry Regiment, and Colonel A. N. Slocum, Jr., CO, Fort Richardson. (U.S. Army Photo)

of the above type of analysis by requiring a written description of the experimental approach the scientist proposes to take, and by requiring a budget estimate. This document is the Memorandum for Record and Approval of Expenditures. It is abbreviated to MRAE and pronounced "emray." The MRAE is the central document in every laboratory project; it must be approved by a certain segment of management before funds are released to the scientist. Our Program Control Office is the disbursing agent for project funds and it records all expenditures. It can make reports on total expenditures that are not more than a week old, and can locate and correct errors in charges made by individual employees. It issues planning schedules that show man-hours used on each project against the total time estimated for the project. It provides for transfer of funds between segments of the laboratories.

Diversified laboratories like ours carry projects that vary from basic research to specific hardware design and development. The amount of detailed planning shown in the MRAE will vary accordingly. The basic research plan will not contain as much detail as the hardware development type of project. We have found it is the field of basic research that seems to offer the greatest resistance to the planned approach. Basic research projects, however, have certain common features that permit supervisors to establish check points for evaluating progress.

1. Search the literature
2. Determine all possible approaches
3. Choose the most promising approach
4. Assemble and calibrate apparatus
5. Take measurements
6. Stop the work and write a report

W. F. G. Swann would call these "units of achievement" and would evaluate progress by noting whether the scientist is accumulating problems faster than he can solve them. If so, then the task is too difficult for him and a fresh start should be made. We have found "Swann's Criterion" a useful guide in the management of research.

Every scientist follows this sequence in the conduct of research and will offer little objection to its

use as a framework for planning. The amount of time and money to allot to each unit of achievement can be estimated only by experienced people. In the case of a laboratory that has no experience in this kind of planning, the only way to begin is to make a beginning, let an estimate be made and let progress be checked continually against the estimate. After a series of grossly inaccurate estimates, the judgment of the scientific staff will improve and the estimates will become quite reliable.

The errors in these estimates will arise mainly from the unforeseen accidents of research which are more frequent and more costly than the errors in production type estimates. The scientific staff should not be expected to bear the entire onus of these errors; they represent the normal risks of research which management shares with its laboratory staff.

Helpful Hints

The manager of research and development laboratories who wishes to experiment with measures for increasing efficiency may find the following hints of some value. They are presented here as findings we have made in our own laboratories in the course of the management improvement program.

The Principle of Limited Capacity for Improvement

This principle will help the eager reformer to remember that patience is a priceless asset when trying to improve management. There is no part of an organization that can resist reforms as strongly as management, and unless at least a third of top management is favorably disposed, the prospects are not bright. Furthermore, the top third absolutely must include the chief of the organization. Given this minimum condition, we have to recognize the fact that the capacity of top management for improvement is limited by personalities and by constraints which they cannot alter. The usual management improvement program seeks to accomplish too much. It will get off to a fine start, move forward with promise, and later slow down to a

stop. This is the time to be on guard against discouragement and disgust. Organizations are like digestive systems; they can swallow only a certain amount of reform. At intervals they seem to require a period of digestion and assimilation. There is no reason to be discouraged if only part of the improvement program can be accomplished. A small deed done is greater than a large deed planned.

When to Write a Report

The time to begin writing a report is immediately after the experimental plan has been chosen and before any experimental work has been done. If the scope of the project has been determined, and it is certainly limited by the budget, it is entirely possible to prepare an outline of the report very early in the project. If the project is very complicated and one can discern several "units of achievement" within the experimental phase, then a report is very likely desirable for each of these units. If the investigator has the report outline before him, he will find it easier to

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remain on course and not be distracted by interesting detours. He will also know when to stop running experiments and get busy with paper and pencil. It is quite important, too, that he actually separate himself from laboratory work while writing the report. Laboratory work is always more interesting than report writing, and will be given precedence on the slightest excuse. The writing itself should be leisurely. This is the opportunity for creative thinking that we deplore the lack of, and it should be welcomed as a respite and change of pace from the experimental work. It is often desirable for the writer to remain away from the laboratory environment altogether; he should write in seclusion, possibly at home or even at some nearby resort where the change of scene may be a beneficial stimulant.

Research and Development Cannot be Separated

It is no accident of language that brought together the words research and development. It is the large, coordinated program such as



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those sponsored by the Department of Defense that demand the continual interplay of scientific research and engineering development. In all the varied development projects that have passed through our laboratories, there have been none that did not require supporting research work.

Of all these, the development of a seal for the recoilless cartridge case can be presented as a typical example. The recoilless case is perforated to allow part of the gases to escape rearward through a venturi, and thus balance the recoil forces. These holes must be sealed to protect the propellant during shipping and storage. The seal must exclude moisture effectively and must also rupture upon firing the round. The development services did not have the specialized knowledge required for the choice of material, so this problem was studied by the organic chemists who searched the entire field of plastics for likely materials. They conducted research themselves in order to obtain the desired properties in the seal. Their first products were then turned over to the development services for making experimental ammunition and for firing tests. It was then found that the materials, although mechanically satisfactory, tended to char and foul the gun. This result was not anticipated, and it meant that the seal must be completely combustible in addition to the other requirements. The problem was returned to the research chemists who developed a new seal containing nitrocellulose for combustibility. This in turn generated the problem of stabilizing the material against deterioration in storage. The new seal has been developed and accepted by the development services, although the study of stability has not been completed. This will be finished later and all possible improvements in that direction can be made even during production of the ammunition.

Here it was essential to have a research laboratory associated with the development engineers. This example was chosen because it was simple to describe and to understand, but the typical situation is more complex.

The history of our laboratories

and of every other research and development facility will show this experience repeated in the case of every major project. It is possible to conduct research without development, but it is not possible to carry on first rate development work without adjacent research facilities.

The Dichotomy of Research and Development

It is with hesitation that anyone today approaches an examination of the term research and development. The phrase has been belabored to the point of exhaustion for most readers. The few comments offered here are intended to go no further than to show a useful framework for displaying the research aspects of development projects.

In the first place, both research and development belong to the class of human activity called scientific inquiry. So far this implies no more than the discovery of truth by scientific methods. Historically, research has been the pursuit of truth for its own sake, and the applications of these truths to development problems came later at the hands of other men. But today we perform both research and development in the same laboratories and seek to coordinate them.

In the physical sciences the pursuit of truth through research has always concerned itself with the physical aspects of nature. Research has always been a study of the "behavior of matter." The development engineer would call it "properties of materials." The two phrases are perfectly equivalent; one suggests the cloister, the other the factory.

If we accept "properties of materials," it can be seen that the research may concern itself with either of two situations. In Type I research, the investigator has selected the materials and is studying their properties. In Type II, the properties have been decided and he is seeking a material with those properties. Type II is frequently derived from development projects, as in the case of the recoilless seal that was described above. Type I is typical of academic research, al-

though it too is commonly derived from development projects.

Development projects can also be divided similarly into two types. Development is always concerned with fabricated materials having shapes and properties directed toward a human need. There enters here the notion of human need beyond the pursuit of truth which characterized research. We might, therefore, say that development, like research, is a study of the properties of materials, but materials fabricated into a particular form designed to satisfy a human need. The dichotomy then proceeds according to either of two situations that may exist. In Type I development the fabricated materials are given and we seek to find their properties. Type II development seeks to find the fabricated materials after the properties are given. This requires translation into engineering language. In Type I we are given the hardware and told to find out how well it performs. In Type II we are given the military requirements and told to design the hardware.

The problem which any investigator is working on can be placed easily into one of these four categories. This is particularly true of the isolated projects often found in the science departments of the universities. But in the large research and development centers, including the research institutes operated by some universities, the projects, or segments of them, frequently move between Types I and II, and from research status to development status.

This is only of consequence insofar as it threatens to upset the original planning. Note that in either research or development, Type II work is more difficult than Type I. The risks in Type II are greater and the work requires, as a rule, higher calibre personnel. It is important, therefore, to know when, and to what extent, portions of Type I projects revert to Type II.

These categories are useful in the initial approaches to research and development projects. They give a good indication of the kind of professional talent required, whether theoretical or practical.

The whole field of scientific inquiry can be classified into Type I and Type II problems if we accept "substance and function" as generalized concepts of materials and

properties. The following list shows how generally this viewpoint applies. It will be left as an exercise for the reader to classify his own projects.

Classification of Research and Development Problems

	Substance	Function
1. Find an alloy for engine parts that will withstand high temperatures within a jet motor. (Research Type II)	sought	given
2. Design a motor for aircraft that operates on the jet principle. (Development Type II)	sought	given
3. Find the cause of corrosion cracking of brass ammunition. (Research Type I)	given	sought
4. Find a fungicide to prevent tropical deterioration of wooden ammunition boxes. (Research Type II)	sought	given
5. Determine what chemical group in the fungicide molecule is the active agent against fungi. (Research Type II)	sought	given
6. Find a cure for cancer. (Research Type II)	sought	given
7. Determine whether aspirin will cure cancer. (Research Type I)	given	sought
8. Design a "Fountain" pen that uses paste ink instead of liquid ink (ball point) (Development Type II)	sought	given
9. Determine whether the new light rifle can hit a man at 600 yds. (Development Type I)	given	sought
10. Find an explanation for failure to discover any "ether drift" in the Michelson-Morley experiment. Research Type II)	sought	given

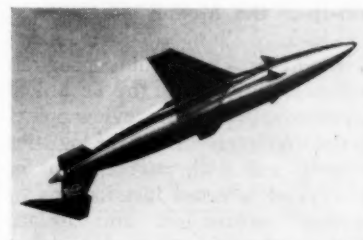
Radioplane Announces New Rocket Drone

VAN NUYS, Calif.—Radioplane Company announced recently the development of a new rocket powered target drone series designated the RP-70 type. Designed for weapon system evaluation and training in the Mach 0.9 class at 50,000 feet, the RP-70 is powered by a solid propellant rocket with a flight endurance of eight to ten minutes.

The airframe, weighing 300 pounds, is specifically designed for high volume production. It is slightly over nine feet in length with a wing span of five feet. With the exception of the steel rocket motor case, which makes up the mid section of the fuselage, all other primary structures are made of glass fiber, reinforced plastic.

The plastic wings, horizontal and vertical stabilizers are fixed surfaces. Control of the drone is accomplished by small canard-type vanes located just forward of the wing and linked directly to the flight control system.

Payload capabilities are sufficient to accommodate the special tracking and scoring equipment re-



quired by the Armed Services in training, evaluation and the development of tactics for their various defense missile systems.

RCA Is Building Electronic Fire-control Radar System For the Starfighter

The Radio Corporation of America has developed and is producing a compact, lightweight electronic fire-control radar system for the world's fastest combat plane, the new F-104 Starfighter jet of the United States Air Force, it was disclosed by Theodore A. Smith, Executive Vice-President, RCA Defense Electronic Products.

The Starfighter, ultrasonic jet aircraft developed by the Lockheed Aircraft Corporation, California Division, was revealed recently by Lockheed and the Air Force.

Ideas in Operation

A monthly review of some of the better ideas adopted by installations in the Armed Forces. Can these ideas save for you?

Case One

Reported By:

Deputy Chief of Staff for Logistics.

Improvement:

Reduction and elimination of excessive and burdensome reporting throughout the logistics system.

Date Installed:

Fourth Quarter FY 1956.

Field of Emphasis:

Improvement Objectives for the logistics system and improvement of administrative functions related to primary programs.

Background:

a. Reports control and administration is a DA requirement. Authority AR 335-15, 335-30, SR 335-15-5, DA Memo 335-15-2 and 335-15-3.

b. This is a continuing program within DCSLOG and the Technical Services with periodic review points to determine essentiality of logistics reports; and with participation in surveys at selected installations to improve procedures and isolate high-cost reports and reduce selected logistics reports and report groups.

c. To eliminate the problem of over-administration and reduce the unwieldy and costly reporting system, the Chiefs of Technical Services on 21 May 1956 were directed to take command and staff action for reduction of selected logistics reports.

d. During Fourth Quarter 1956 the following actions were taken:

(1) One hundred fourteen (114) new reports control actions were reviewed, of which nine (9) were disapproved and seven (7) were reduced.

(2) Fifty-six (56) existing DCSLOG reports were reviewed, of which six were rescinded and three (3) were reduced.

After Improvement:

Provide a reporting system

This new section in ARMED FORCES MANAGEMENT is intended to bring you each month case histories of importance which may be applicable to your operation. Have you the history on file of an idea which could assist others? If so, send it in the form shown on this page to ARMED FORCES MANAGEMENT.

which will (1) assist all echelons to more effectively manage and control operations; (2) better utilize available data; (3) eliminate and reduce non-essential reporting, and (4) produce purposeful and economical reports.

Benefits:

Estimated benefits from reporting actually eliminated through disapproval, rescission, and reduction of proposed and existing reports during Fourth Quarter FY 1956 totals \$378,100.00.

Management Techniques Used:

Analysis and evaluation of procedures, and periodic review of reports and surveys of installation reporting.

Case Two

Reported by:

Headquarters First Army, Fort Jay, New York.

Improvement:

Management Improvement Economies in the Administration and operation of Transportation Motor Pool.

Date Installed:

1 July 1955 (continued throughout entire fiscal year).

Program Affected:

Nr 11E-Logistic Services; Nr 10-Supply Distribution and Maintenance.

Background:

Continued losses of enlisted drivers resulted in the necessity for utilizing other means of transportation.

To overcome the driver shortage, the user-driver program was emphasized, and particular stress was placed upon utilizing local commercial transportation in lieu of government vehicles.

Before Improvement:

Although vehicles were on hand for dispatch, drivers were not available. The volume of requests received could not be handled.

After Improvement:

As a result of the continued increase of use of commercial transportation and the user-driver program, it has been possible to reduce operating costs of the motor pool, reduce vehicular requirements, and increase the overall utilization factor of currently authorized vehicles.

Gains:

a. Economies through use of local commercial transportation:

1st Qtr.—\$33,353.84
2nd Qtr.—\$37,528.68
3rd Qtr.—\$29,343.60
4th Qtr.—\$31,041.51
Total — \$131,267.63

b. Vehicles declared excess:

1st Qtr.—2 light sedans
1 medium sedan
2nd Qtr.—4 light sedans
3rd Qtr.—28 light sedans
1—1½-ton panel truck
4—1½-ton trucks
4th Qtr.—1 light sedan
2—1½-ton trucks
1—2½-ton truck

Total—35 light sedans
1 medium sedan
1—1½-ton panel truck
6—1½-ton trucks
1—2½-ton truck

c. Personnel declared excess:

1st Qtr.—1 civilian heavy vehicle driver
2nd Qtr.—
3rd Qtr.—2 civilian truck drivers
2 civilian chauffeurs
4th Qtr.—1 civilian auto mechanic
1 EM wheel vehicle mechanic
1 EM motor maintenance NCO
Total—1 civilian heavy vehicle driver
2 civilian truck drivers
2 civilian chauffeurs
1 civilian auto mechanic
1 EM wheel vehicle mechanic
1 EM motor maintenance NCO

NOTE: Computation of dollar benefits is shown on the following page.

ARMED FORCES MANAGEMENT

New Propeller Design Gets OK from CAA

An approved type certificate for a new hollow aluminum aircraft propeller blade has been granted by the Civil Aeronautics Administration to Hamilton Standard, division of United Aircraft Corporation. Erle Martin, general manager, said that the blade "is one of the most important steps forward in propeller design in the past ten years."

Under development for the past six years, the blade has been selected for Lockheed 1649F Constellations on order by Trans-World Airlines and Lufthansa of Germany, and Lockheed propeller-turbine Electras ordered by KLM of Holland. The first 1649A has already flown.

The new blade can be made in a variety of sizes for most large modern aircraft by the same basic extrusion process used for many years in the manufacturing of other aluminum articles. After extrusion,

flattening and twisting, it is partially filled with a cured synthetic sponge compound for additional support. An exterior coating of nickel plate to protect it from erosion and abrasion damage is the final step.

The new blade is significant, Mr. Martin said, "because it provides the lightest, strongest structure to do the propeller's job. Its saving in weight over conventional solid aluminum alloy blades means that propeller hubs can be lighter. The end result is a propeller which absorbs more horsepower per pound of weight than any other type in propeller history."

Ninth College-Industry Conference To Be Held

The Ninth Annual College-Industry Conference sponsored each year by the Relations-with-Industry Division of the American Society for Engineering Education, will be held on January 30 and 31, 1957, at the University of Cali-

fornia, Los Angeles, under auspices of University Extension and the U.C.L.A. College of Engineering.

The Relations-with-Industry Committee of the Pacific Southwest Section of the Society is planning the conference program to provide interest to people from industry and education alike.

The conference, held on the West Coast for the first time, will have as its theme, "Improvement of the Engineer—A Dual Responsibility of Industry and the Engineering School." Emphasis throughout will be on improvement of the engineer rather than on the training of more engineers, according to J. M. English, conference chairman.

During 1955 Army Signal Corps personnel made suggestions that each year will save the U.S. taxpayer almost \$1,000,000 (M). One suggestor received \$775, the highest award paid for a suggestion to an Army woman employee.

Ideas in Operation (Continued)

Formula Used in Computing Benefits

Number and Type Vehicles Excessed	Acquisition Cost	Total Cost
35 Lt. Sedans	\$1078.84	\$37759.40
1 Med. Sedan	1479.00	1479.00
1 1/2 Panel Truck	1345.00	1345.00
6 1/2 Trucks	1834.00	11004.00
1 2 1/2 Truck	3089.00	3089.00
Total Acquisition Value of Vehicles Excessed		\$ 54,676.40
Annual maintenance costs eliminated on vehicles excessed above (based on an average cost of \$30.00 per month per vehicle)		15,840.00

Number and Type Personnel Excessed	Hourly Rate	Total Annual Cost
1 Driver WB-9	\$2.11 (a)	\$4388.80
2 Drivers WB-6	1.93	8028.80
2 Chauffeurs WB-4	1.88	7820.80
1 Mechanic WB-10	2.16	4492.80
1 Mechanic E-4	1.38 (b)	2870.40
1 Mtns NCO E-6	1.73	3598.40

Anticipated OI Benefits on Annual Basis 31,200.00

(a) Second step of Wage Board Schedules used
(b) Military Pay Rate secured from SR 35-4300-2

Driver Cost Eliminated:

Qtr	Tickets Issued	Trips	Driver Hours Saved	*Cost Driver Hours Saved
1st	27774	13887	27776	\$31386.88
2nd	32182	16091	32184	35160.32
3rd	24466	12233	24466	27646.58
4th	25872	12936	25872	29235.36

Total Cost of Driver Hours Eliminated \$123,429.14

*Number of tickets divided by 2 equals number of trips. Each trip is considered to require 2 hours driver time. Number of trips multiplied by 2 equals driver hours saved. Average driver hourly rate computed at \$1.13 per hour. Driver hours saved multiplied by hourly rate equals cost of driver hours eliminated.

Maintenance Cost Eliminated:

Qtr	Tickets Issued	Mileage Saved	Maintenance* Cost Eliminated
1	27774	138870	\$6149.16
2	32182	160910	7240.96
3	24466	122330	5504.85
4	25872	129360	5821.21

Total Maintenance Cost Eliminated \$ 24,716.18

*Each trip is estimated at 5 miles. Number of trips multiplied by 5 equal miles eliminated. Operational and maintenance cost for vehicles averaged at .045 per vehicle mile. Miles eliminated multiplied by .045 equal maintenance cost eliminated.	
Total Driver and Maintenance Cost Eliminated	\$148,145.32
FY 56 Cost of Commercial Tickets, Tokens	—16,673.80
	131,471.52
FY 56 Imprest Fund Expenditures	203.89
Economies Effected by Use of Commercial Facilities	\$131,267.63
TOTAL BENEFITS	\$232,984.03

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Mechanics and laboratory technicians in need of small replacement parts now can obtain them at a self-service "dime store," without any paper work at the Air Research and Development Command's Wright Air Development Center. Here an electrician is shown picking up parts he needs from the Experimental Fabrication Division's "dime store" while supply personnel check the stock level in the left background. Each of the 12 "dime stores" in existence at WADC carry "bench stock" applicable to the shop or laboratory. (USAF PHOTO)

How the Air Force is Using "Dime Stores" to Save Time and Men

The Air Force appears to have nothing in common with supermarkets and five and ten cent stores. The Air Research and Development Command (ARDC), however, is using a combination of methods from the two commercial types of business in its supply work.

Results are inestimable savings in manhours and aircraft ground-time, as well as fewer delays in the research and development effort.

Now in use at ARDC's Wright Air Development Center, Dayton, Ohio, and scheduled for adoption by other ARDC Centers, are self-service "dime stores." The stores keep thousands of small parts, called "bench stock," moving to the mechanics and fabricators in WADC's shops and laboratories.

The counters in the "dime stores" look like those in the commercial five and dime store, with the "merchandise" separated by glass-partitioned bins on long tables.

Before establishment of this new system, mechanics and laboratory technicians at WADC were obliged to go to one central building for parts, whether it was one bolt or many. This proved time-consuming and often resulted in extensive on the ground time for aircraft when parts were unavailable. Many experimental projects were delayed by frequent trips for parts necessary to complete apparatus used in the laboratories.

In 1953 the first "dime store" was

installed in the Electronics Components Laboratory at WADC. All parts needed by that laboratory were placed in bins and with each bin went a stack of 2 by 3-inch cards, giving the name of the item in the bin, the stock number, the unit price and the level of supply carried.

The laboratory technician helped himself to the part he needed. He then removed a card from the bin, filled in the number of parts he had taken, and in the manner of a supermarket customer passing the check-out counter, dropped the card in a box.

Once a week the cards were collected and the items consolidated. A replacement requisition was made out for the consolidated list.

Later it was decided that even this paper work was unnecessary.

Now the technician or mechanic takes parts without filling out a card and the "dime store" operator renews stock when it becomes low. It is estimated that this saves at least twenty hours a week in typing requisitions.

Since the first dime store at WADC, eleven others have been installed and five are planned in the near future. At each location, the items peculiar to that activity are stocked, with a grand overall total of 33,522 line items. There is a weekly turn-over of forty per cent.

The Supply Section of the Direc-

torate of Support reports that beside the saving in manhours, aircraft ground-time and research and development time, the new concept has brought about a better control over supply levels.

Army Views New Missile Tester by Sperry

RACE, an ultra-rapid missile tester which enables highly mobile guided missile troops to strike targets faster and more effectively, was demonstrated to Army officers recently by Sperry Gyroscope Company.

The new device is the first to bring automation into tactical combat areas to test, troubleshoot, and service complex missile systems as they are emplaced at new launching sites.

Observers saw lights and screens flash decisive data while computer punch cards directing remedial actions ejected from a model console simulating full-scale action of the missile tester. Other versions of RACE (Rapid Automatic Checkout Equipment) will test complete supersonic aircraft systems and fire control systems aboard ships.

At the push of a button, RACE dynamically tests each missile unit, performing in minutes the hundreds of preflight tests that would consume vital hours by more conventional means. A master console employs lightning-fast computer elements to checkout all units of the entire missile system, provide necessary maintenance, and supply critical information for command decision during final countdown.

Where trouble exists, RACE pinpoints the faulty component, flashes its location and replacement time on a console screen, and immediately delivers a computer punch card spotting the plug-in replacement for technicians.

● The Pitney-Bowes, Inc., offices at Toronto, Canada, have a distinctive method of giving top-producing salesmen permanent recognition. Each year, the name of the top salesman is inscribed on the back of a fine wood chair at the conference dining table at the head office. *Personnel Policies and Practices Report 1-24-56 - Copyright, 1956, Prentice-Hall, Inc.*

How Ryan Found that Engineered Diversity Pays

AMERICAN industry has done well with the slogan, "It Pays to Advertise." Ryan Aeronautical Company has found a complementary slogan to be equally advantageous: "It Pays to Diversify."

Actively engaged in all phases of the three fields of aviation manufacturing—airframe, propulsion and electronics—Ryan is one of the most diversified companies in the aircraft industry. Major projects in jet VTOL aircraft, automatic global navigation, supersonic missile guidance, turbojet, rocket and ramjet engines, drone targets and afterburners put Ryan squarely in the center of some of the most advanced and significant aspects of U. S. air power.

The company's versatility is bred from long years of experience. In 33 years, Ryan has designed and produced 25 different types of aircraft, missiles and drones and has pioneered in jet powerplants, afterburning and continuous-wave radar.

Spearheading Ryan's program of diversification is the engineering division which, on the other hand, reaps many benefits from the many-faceted research, development and production activities which Ryan pursues. Diversification provides greater opportunities for growth for engineers. Better engineers, fortified with broader knowledge, enhance the company's success in diversifying.

"Because of diversification, Ryan has every engineering function that a company three times its size can have," says Curtis L. Bates, assistant chief engineer. "This division has more than tripled in size in three years and now tops 800. Every engineering field is represented and Ryan is doing work in such progressive areas as advanced electronics, vertical take-off and landing aircraft design, flutter investigation, hydraulic design and systems analysis. Diversification makes it both necessary and possible for Ryan to have experts in every phase of aviation engineering."

Individual engineers find that Ryan's wide-spread interests affect

them directly. College graduates choose their own field at Ryan. More experienced engineers who want to broaden their backgrounds are encouraged to transfer from section to section if they desire. Or, if they prefer to focus their training in one field, that also is possible.

"Every well-balanced engineering department needs two kinds of men," Mr. Bates explains, "the specialist and the general background man. Specialists are technical experts responsible for the narrower, more advanced phases of engineering work. Men with wider experience coordinate the work of the specialists and might be called the business managers of the division. Ryan is set up to recognize both on a comparable basis. In many plants, the only way to advance is through management. We are convinced that the technical expert should be allowed to make his contribution in the technical field.

"Looking a long way into the future, Ryan wants a broad base of engineering experience, but it wants experts, too."

Even "experts," however, like to spice their work with variety. Take an electronics engineer as an example. Currently under development or in various stages of production at Ryan are approximately a dozen different electronic projects—all of an advanced nature, highly classified and offering first class opportunities for an extremely satisfying career. Several of these projects, moreover, because of their unique nature, give an engineer the chance to "follow through."

"Follow through" is the somewhat controversial policy of allowing an engineer to see his "baby" through all stages to the final report. Frank Willard and Robert Sollars, for instance, worked from design to flight test on the helicopter hovering indicator developed by Ryan. "Follow through," however, is not always practicable. Usually an engineer gets to a point where someone else less experienced—or more experienced in another line—should take over from

him. Ryan sees advantages in "follow through" in some cases, but feels there is another aspect of this policy which is more desirable; that is, following through with an idea rather than a project. Suppose a man in preliminary design works on, say, half a dozen projects dealing with the VTOL concept. While he doesn't carry a project through, he is responsible for carrying an idea through. In the long run, that's more significant and more valuable to the engineer.

"Actually, it's easy for an engineer to keep track of the progress of his 'pet' project at Ryan," says Ralph Haver, special projects engineer. "No one is bound to a desk or drawing board as sometimes happens in a larger, less integrated plant. We all take looks in other sections to see how things are going or to check on what's new in the research labs."

"What's new in the research labs" is the other side of the diversification coin. As important as trained manpower to successful versatility is the need for adequate research facilities. To give promising new ideas the right climate in which to "bloom" into new products, Ryan maintains well equipped laboratories covering all areas of its manufacturing activities.

Perhaps the most dramatic of these facilities is the new \$375,000 jet engine test cell, capable of handling jet engines in both the horizontal and vertical attitudes. This is the only test cell with this capability in the country, and offers Ryan engineers incomparable opportunities to correlate knowledge with experience in the rapidly expanding jet powerplant field.

Probing avionic potentialities is Ryan's electronics laboratory, recently installed in its own new building and furnished from penthouse to photographic unit with the most modern equipment. Although it surveys a fine sweep of San Diego bay, the "penthouse" isn't the glamorous hideaway its name suggests. It is a microwave research lab, strategically located to use the regular arrival and departure of planes at nearby Lind-

bergh Field in its radar test operations.

High temperature metallurgy is another Ryan specialty made possible by its research facilities. More than 40 high temperature alloys are now being handled by Ryan—as many as by any other company in the country, regardless of size. Unique fabrication techniques for titanium and titanium alloys, advanced structural methods, high temperature honeycomb and close to three dozen original chemical formulations which improve production procedures have come out of the materials and processes laboratory. In another part of the plant, the welding lab is pioneering in welding methods which have made Ryan famous as an expert in this field. In many cases, jet engine contracts are directly traceable to Ryan's proficiency in welding and the reputation of Ryan engineers for being able to lick stubborn welding problems.

Other specialized test facilities such as the instrument lab, chemical and metallurgy lab, automatic pilot lab, hydraulic lab and en-

vironmental test lab will soon be concentrated in a new engineering development center for greater coordination and emphasis on the important research side of Ryan's diversification.

"In addition to variety of experience and the backing of research, there is still another advantage diversification gives Ryan engineers," Curt Bates concludes. "Professional men in any line like to keep abreast of all new developments in their field. Through the combination of Ryan's prime contracts and subcontracts, we have contact with every major aviation project under Uncle Sam's hat. Ryan builds parts for every jet manufacturer in the U. S. and is directly involved in VTOL and STOL aircraft, high temperature structures, advanced electronic equipment, very large structural elements, rocket motors and ram-jets. For that reason, you could say an engineer at Ryan has his finger on the pulse of the industry, his eye on the future and both feet on the ground!"

processes still highly classified," he said.

"However, the most important element in the development of this project is professional scientific people and although security regulations prevent disclosing the exact number of people working on the nose cones I can reveal that we have well over several hundred top research scientists and engineers employed in our department, as well as the support of the engineers and equipment of the numerous General Electric research laboratories."

Nose cone research and development at General Electric is part of a prime contract with the Western Development Division of the U.S. Air Force, Air Research and Development Command.

● New study by Life Extension Examiners shows that health problems of executives begin . . . even at 30. The 31-to-40-year-old group shows a sharp rise in ailments such as indigestion, fatigue, chest pains. Heart troubles begin. And rising tension on the job is reflected in a rising number with high blood pressure. From article, "Critical Health Age: 30-40," in *Business Week* 3-3-56.

G.E.'s Metcalf Outlines Nose Cone Problem In Ballistic Missile Race

In the intercontinental ballistic missile race, the development of a nose cone which can withstand flight conditions similar to that of a meteor is one of the most challenging problems facing engineers today, according to George F. Metcalf, general manager of the General Electric Company's Special Defense Projects Department.

The nose cone is the extremely forward part of the missile which carries within it control equipment and the missile warhead.

According to Mr. Metcalf, the flight of the ballistic nose cone is similar to that of a meteor in that it must descend from extreme altitudes at hypersonic velocities and must re-enter the dense layer of air surrounding the earth.

"However, unlike a meteor, missile nose cones must not break or burn up but must remain intact and functional. In a sense, General Electric engineers and scientists are designing better meteors," Metcalf said. Mr. Metcalf's comments

were made following a recent announcement by the U.S.A.F., that the General Electric Company's Special Defense Projects Department has been awarded a prime contract to develop nose cones for the nation's top-priority project, the development of strategic ballistic missiles for the U.S. Air Force.

"The tremendous magnitude of this task is emphasized by the fact that the relatively little knowledge existing at present in the new fields of aerothermodynamics, aeroballistics, hypersonic and other fields must be extrapolated into unknown technological areas. This means that the frontiers of science in physics, chemistry, metallurgy, electronics and other basic sciences must be expanded and new research tools must be developed to enable scientists to work in technical areas never before explored," Metcalf said.

"At present we are designing unique shock tunnels and ballistic firing ranges to simulate conditions which will be encountered by the nose cone in its flight, as well as many other test equipments and

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How Patuxent is Solving Trained Personnel Shortage Problem

The need for qualified technical engineers and the shortage of trained men to fill this need is a problem across the nation, but at the Naval Air Test Center, Patuxent River, Md., this problem is being solved.

A long-range educational program, the first of its kind set up in the United States, was established to train civilian men to fill the numerous openings for engineers in the various test activities at the center. The Patuxent Plan, as it is called, was set up by Mr. E. H. Ocker, Industrial Relations Officer, last November.

The plan covers a 10-year period . . . 5 years spent in academic and on-the-job training to obtain an engineering degree, followed by 5 years obligated service as an engineer in a civilian capacity.

Twenty-five to thirty men are recruited from the area around Patuxent River at the beginning of each college year. In order to qualify for the program, these men must pass engineering aptitude tests set up by the Navy and they must meet all eligibility requirements of St. Mary's Seminary Junior College, St. Mary's City, Md., and the University of Maryland.

For the first three years, the students combine on-the-job training with classroom training. Two days of the week are devoted to classroom studies at St. Mary's Seminary, with additional evening and Saturday instruction given from the College of Special Continuation Studies of the University of Maryland. For the remaining three days of the week, students work on actual job assignments in the test units.

At the end of three years, the student has acquired Junior standing and is transferred to the University of Maryland. At the University, the student specializes in aeronautical, mechanical or electrical engineering and participates in the usual school curriculum necessary to obtain an engineering degree. During the summer, he returns to work at the Test Center.

Tuition fees are paid in part by the Navy, beginning with 1/3 of the tuition during the first year and

increasing proportionately each year until the last year is completely tuition free. In addition, the students receive a yearly salary, beginning at \$2960 and increasing annually.

Effects of the plan will develop in 1960, when the first class will graduate. Fifteen trained engineers will be added to the NATC engineering staff for five years obligated service. Each year thereafter 20 to 30 men will be added.

And how do the students feel about the Patuxent Plan? The majority of them are recent high school graduates who would have had no opportunity to attend college without this program. The Patuxent Plan gives them educational opportunities, but also provides a desirable career.

A typical student is Thomas Hammett, president of the class of 1961. Before enrolling in the program, Tom was employed for six years as a mail clerk in Great Mills, Md.

"My job offered security," Tom explained. "But there was little chance of advancement. When I learned of the Patuxent Plan, I knew it was an opportunity I didn't want to miss."

After passing the necessary aptitude tests, Tom and 26 others were selected from the 95 applicants to enroll in the class of 1961. The students are now attending St. Mary's Seminary Junior College twice weekly, in addition to working in the test units on the station.

Enthusiasm and ambition run high in the class, and the students are in unanimous agreement with Tom when he says, "It's a wonderful opportunity, and I intend to use the best of my abilities to make the most of it."

New QM System To Use EPTS

The Quartermaster General has instituted an extensive system-wide program throughout the QM Depot System to install and utilize engineered performance time standards (EPTS) to further improve operations effectiveness and efficiency. Typical of the efforts to-

ward this objective now taking place at each QM and General Depot is the activity taking place at Richmond QM Depot.

The course has been designed to develop the specialized skill capacity required to establish engineered performance standards in the Quartermaster depot system.

One of the foremost problems facing the technicians will be the development of standard data and time formulas to cover the maximum range of normal depot activities.

Standards' technique studies were directed toward and provide for the following accomplishments.

(1) Finding the most economical way of doing the work, (2) Standardizing the methods, materials, tools and equipment, (3) Accurately determining the time required to accomplish the job, (4) Training the worker in the new method and (5) Accurately recording and reporting the worker's daily output in terms of units produced and manhours expended as compared with the standard, to increase the effectiveness and efficiency of individual operator and first line supervision as well as improve utility of controls at higher echelons.

The initial project of the group at the Richmond Depot will be a study of the Depot Maintenance Division.

Philco Miniaturizes "Electronic Brain" For Navy Jets

The Philco Corporation has demonstrated that a universal, high-speed, airborne computer — until now destined only for the big bombers because of size and weight — may be miniaturized for use in Navy jet fighter planes.

According to James D. McLean, vice president and general manager of Philco's Government & Industrial Division, a new type of digital computer, or so-called electronic "brain", may be used to consolidate the functions of many conventional airborne computers into a single compact system. A jet fighter control computer must "think" faster than the speed of the plane in which it is carried, and continually solve complex problems in split seconds, or "real time."

Why An Accounting Career With Army?

Clark L. Simpson takes you inside one of the nation's largest public accounting firms, a firm which has hired as many as 400 accounting graduates in one year, and tells you why . . .

ARMY AUDIT Agency is one of the Nation's largest public accounting firms! Professional audit standards are followed and most supervisors are Certified Public Accountants taken from the public practice. Our approach to an audit is the same as that of the practitioner and our report is equally objective.

When an unusually well qualified accountant is called to active service, he is most frequently assigned as MOS which will result in his being designated for Army Audit Agency where his specialization can best be used. At present Army Audit has a military contingent of 647, and most of these are qualified technical auditors. These men work side by side with the 2000 civilians and are given similar assignments according to their abilities. In fact, military audit personnel starting with the Agency are given an unofficial GS rating based on background and education. With experience and progress, he moves forward to a higher grade. The soldier auditor is making a real contribution to this Agency.

Performance evaluations, described later, are administered to all employees, military and civilian alike. In fact, in almost every respect, men in uniform and men in civies are the same; they sit at adjacent desks, act as supervisors, as lead men, as journeymen or trainees, go on jobs together and in practically every respect are exactly

alike except for differences in dress. They are affected by the career development plans which, initially, were devised for civilians, and it is therefore discussed in this article.

Military men are assigned to training classes along with civilians. The training staff utilized in the classroom instruction consists of supervisory auditors, military and civilian, selected from all over the United States, who are best qualified to present the subjects assigned to them. It is now recognized in Army Audit that a proper start for a new employee will materially assist him in doing his best work within a minimum period. By gaining information about his new environment and the work expected of him, he develops a favorable attitude and a sense of purpose. The new employee has a tendency to become lost in a maze of new phraseology, new procedures, and unfamiliar work schedules. A good orientation program reduces early turnover and develops desirable work habits.

Employees recruited upon graduation from college and qualified military technicians do not need schooling in basic accounting or auditing. They know accounting theories and are fully qualified in this respect. They do not know Army accounting and Army auditing procedures. In giving them this training, our teaching staff utilizes actual case situations taken from

Army files. This group consists of employees properly cleared for security and it is not necessary to change any of the facts or the names of the companies in the problems we utilize. We use good as well as bad examples of handling audit situations, in cases presented to the students.

The Career Development Program of Army Audit Agency actually started on a wholesale basis only one year ago. Requirements as to background and experience of military personnel were also tightened. Prior to that time, it was generally necessary to hire supervisory staff from the outside as little thought was given to training men on the job. Production was over-emphasized with staff training minimized. Today in Army Audit Agency each supervisor is responsible for determining that his staff is getting proper training. Further promotion will be denied a supervisor who does not have a trained man ready to take his place.

In one year we have hired 400 graduates from accounting schools throughout the USA. The large recruitment program is possible through an agreement with the Civil Service Commission. Representatives from Army Audit visit the various universities, interviewing the accounting seniors, describing to them the Army Audit Agency program, the career opportunities in the Agency, and selling them on

seeking out employment with us. An examination is given before graduation to qualify such applicants for appointment under Civil Service. Selected applicants are appointed at GS-5, \$3,665. At the end of six months as a result of the intensive classroom and on-the-job training, employees who continue to show promise are promoted to GS-7, \$4,520. At the end of another year, assuming continued progress, these men are eligible for GS-9, \$5,440. Only a very minor number of trainees in previous classes have failed to obtain promotion at the end of the six-month period, primarily because of care exercised in selecting them.

We encourage staff members to continue their studies, regardless of grade. Our supervisory staff is primarily made up of professional Certified Public Accountants, and all employees are urged to prepare for and take the CPA examination as early as they are qualified. We have been actively working with CPA Boards in getting Army Audit Agency experience accepted as meeting the requirements for the examination. A number of States have not yet accepted this experience, but we are not abandoning our efforts.

We have a very serious interest in every individual in the Agency. In fact, we maintain an unusually effective inventory control system relating to each individual (the main asset of Army Audit Agency is its personnel. We, therefore, consider an inventory of our personnel as the equivalent to our financial statement). These control cards are McBee Punch Cards and they contain all conceivable information relating to the individual, his name, location, age, school, vocational background prior to AAA, types of work performed in AAA, performance evaluations, record of special schooling in AAA, and many other facts which are useful in determining whether the interest of our Agency would best be served by offering such an individual an assignment elsewhere. The Staff Management office of this Agency has the primary responsibility for recruitment, training, utilization, and career development of the staff. An important objective of Staff Management is to recruit and develop

a technically qualified staff of auditors to assist in spotting promising executives and in accelerating their development to have them ready for top positions at an age when they can contribute maximum service to Army Audit Agency. Our job is to secure the best raw material (recruitment), process it wisely (education, training, and utilization), and keep it currently inventories to permit the best management of it. We do not consider that the development of administrative leaders is a substitute for the self-made man, but it is an adjunct to assist the determined employee to reach his goal.

We referred previously to the performance appraisal of staff members. Each individual in a supervisory or managerial position is held responsible for helping his assistants to improve their individual performance. Equally important is the responsibility for assisting them to develop their maximum potential as they progress in their careers with the Agency. We have developed two types of staff appraisal forms and procedures, one for trainees through grade GS-11 and another for supervisory employees grade GS-12 and up. These appraisals up to grade GS-11, military and civilian, are made every ninety days during the first year of employment, and upon reassignment, where the employee has served at least thirty days before the transfer. The auditors in the lower grades are evaluated by their superiors on indicated ability, preparation of working papers, meeting and dealing with others, presenting ideas and facts, and administrative ability. Each supervisor is required to point out the auditors' strengths, technical and/or personal characteristics. He is also required to indicate what the auditor needs assistance in so that he may improve. Supervisors must also indicate what is being done to correct these deficiencies. He gives his opinion as to whether the auditor is capable to perform in the next higher grade and if not, how soon he believes he could do so. He is also to indicate development activity which should be engaged in by the employee to improve his potential. The evaluation is discussed with the employee and his

reaction to it becomes a part of the record.

Agency personnel holding auditor positions GS-12 and above, or military personnel performing audit duties of equivalent responsibility, whether in an operational, staff, managerial, or executive capacity, are appraised every twelve months. This appraisal is a technique for evaluating the auditor's performance, personal qualifications, and potential. For this procedure, we use the Committee System. The committee consists of three persons with the immediate superior of the employee acting as chairman. The other two members are selected from officials equal to or higher than the chairman, but not including the chairman's immediate superior. One of these is selected by the appraisee and one by the chairman. Each auditor is evaluated on performance, which includes measurable results. For example, how he meets deadlines on audits, whether the audit report was acceptable, whether he demonstrated the technical know-how needed, whether he demonstrated ability to write

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and speak clearly, whether his influence bolstered the morale of his workgroup, whether his training of subordinates was all that it should be, and whether his evaluation of subordinates was of a proper calibre. A determination is also desired as to whether the individual has contributed to improvement in auditing techniques applied in the audit. Has he the ability to plan, to organize, and to handle people? Is his supervisory ability all that it should be? Has he demonstrated skill in briefing staff members? Does he guide his staff or is he dictatorial? How many of his staff members have qualified for promotion to more responsible jobs? Is he capable of adjusting audit programs to fit special situations? Another division of this appraisal is devoted to personal qualifications of the man being appraised. What are his qualifications that are pertinent to his job? In which ones is he above and in which below average? What are the appraiser's reactions to his temperament, dependability, judgment, and ambition? Does he have initiative? Does he have a sense of devotion to Army Audit Agency? How does he accept criticism?

In discussing this man's potential, effort is made to determine the next step for the individual—is he eligible for the next step? Is he qualified to go beyond the next step? What is the highest job in the Agency for which he can be expected to eventually qualify? What does he want? Has he set his course as to a long-time future with Army Audit Agency? The three members of this appraisal committee arrive at independent conclusions as to rating the individual. However, before the rating form is released there must be unanimity as to the rating to be given. This matter must be discussed at length by members of the Committee and they must agree in this respect. Generally, the Committee comes up with suggestions as to the development of the individual, some of which require initiative on the part of the individuals, others on the part of superiors.

Subsequently, the party being appraised is interviewed by his immediate superior. The purpose of this interview and of telling him of his shortcomings is to help him

develop rather than to criticize. Means are suggested of overcoming deficiencies. His duties and responsibilities are reviewed. He is told of the career development program of Army Audit Agency and assured that the purpose of this appraisal is to help him grow with the Agency. It is generally desirable to discuss the appraisee's major strong points at the start and subsequently discuss his major weaknesses. This puts him at ease at the beginning. He is then asked for his suggestion for overcoming deficiencies, and if he presents a plan, it is his own and he will put much more effort into carrying it out than if it were tailored for him.

At a later date, there is a follow-up on these appraisals to determine whether the planned corrective measures have been taken, whether efforts are being made to correct deficiencies and to assist the career development of this individual.

In our Career Development Program persons occupying executive positions at the present time are not overlooked. Regular seminars are held where headquarters executives meet with regional and branch

executives to discuss new trends as well as new regulations and procedures. This meeting, which generally lasts three or four days, brings headquarters and the field much closer together and enables field men to present their gripes and get answers to problems which have been puzzling them. There is no set program but there have never been idle moments at these seminars. The problem of communication between echelons has definitely improved with the inauguration of this procedure.

We also recently introduced what we term a "three-deep replacement chart." The executive positions in the regions and branch offices are listed. The first name shown is that of the incumbent, and the next name is that of the probable replacement. If such individual were to leave, there is a third name who would be second choice for such a job. In order to intelligently fill out such a replacement chart, an operator must really know his staff. This alone has been most beneficial to our Agency. It is also necessary in connection with this chart that the individual be graded as to job

Top Air Photos Taken by U.S. Planes in Meet

American-made Republic RF84F Thunderflashes won both the high- and low-altitude photography contests in the first international reconnaissance competition between the Second and Fourth Tactical Air Forces. The contest ended with the presentation of the Gen. Alfred M. Gruenther trophy to the Fourth Tactical Air Force.

Competing aircraft were English Electric Canberras, Vickers Swifts and Martin RB-57's. The high-level photography contest, calling for aerial photos from more than a 30,000-foot altitude was won by Lt. Michel Duhaumont of the 33rd Tactical Recon Squadron of the French Air Force, in an RF-84F.

An American, also flying a Thunderflash, won the low-level competition, flying under 1,000 feet. He was Lt. John L. Roberts of Seattle, Wash., of the 66th Reconnaissance Wing. The three-day event required pilots to fly over unfamiliar territory to locate and photograph

pre-selected targets at speeds of more than 500 miles an hour.

Arming and Fuzing Systems Contract to GE

Multi-million dollar contracts for the development and production of arming and fuzing systems to ready and detonate guided missile warheads have been received by the General Electric Company's Missile and Ordnance Systems Department, according to an announcement by George F. Metcalf, General Manager of the Department.

The announcement was made at the second annual convention of the Association of the United States Army.

"The contracts require the production of recently developed arming and fuzing system designs for current Army Ordnance missile warheads; studies leading to the application of atomic weapons; and the research and development of new and improved arming and fuzing systems for future operational guided missiles," Metcalf said.

performance and potential ability. For example, is he filling completely all technical, administrative, audit reporting, and supervisory requirements of the job he occupies and at times fulfilling requirements of the next higher grade. Does he have technical weaknesses or supervisory weaknesses which can be corrected in a reasonable time by further training and experience? Or, has he failed to demonstrate properly to justify retention other than for the fact that no adequate replacement is immediately available. As to potential ability, what is the height to which he could be expected to eventually go in the Agency? Is he eligible now to advance to the next higher position? Has he reached the maximum justified in the Agency, or does his age, health, or performance limit him as to further promotion? With this information we are in a position to select key personnel from one region to fill vacancies in another. It also affords the regional director an opportunity to again assist in improving his staff.

We use a monthly Staff Letter to publicize job openings, to call attention of staff to recent professional literature which they should read and to generally build up enthusiasm for the Agency. This direct approach to each employee monthly is an outgrowth of my own experience in operating my C.P.A. firm a few years back. It is recommended to any organization with a few hundred scattered employees. Following are excerpts from a few letters:

INTRODUCE NEW STAFF MEN! At the training course on February 1, we were emphasizing the need to get acquainted with other participants. We made every effort to handle introductions. One employee stated that in his own office, he had never been introduced to any other employee and that he knew only three other people in the entire region. This is a damnable situation! An employee should be made welcome and should be introduced throughout the office to which he is assigned. Common sense personnel administration will prevent such rudeness to a new employee. The professional approach should apply to

staff as well as to "clients."

February 1955

HAIL TO TEXAS! T. A. Hoffman, Deputy Regional Director, San Antonio Regional Office, is making an aggressive sales campaign for professionalism in AAA. He urges members of the staff to take the CPA Examination, to join and actively participate in professional accounting organizations. He recently obtained a quantity of the AIA booklet "Information for CPA Candidates" which he issued to staff members planning on taking the exams reasonably soon. Of the 125 military and civilian auditors in the region, 18 men are now certified. Twenty-six others have taken the examination, 16 having passed a part. Twenty-four men are studying for the test and a total of 83 expect to file eventually, leaving only 21 men who for personal reasons do not anticipate going after those elusive little letters, "CPA". Good going.

February 1955

PLEASE SPEAK ENGLISH, AND CORRECTLY. Minutes of Staff Conference, Office of the Comptroller of the Army, 21 January 1955 on the subject of Briefing the Chief of Staff:

"**** The Chief of Staff—also is concerned about the use of incorrect English. When incorrect English is used in briefing, he wonders whether the material presented is as dependable as the briefer's use of the English language."

April 1955

TAKE-OVER OF FOREIGN COMMAND AUDITING. A Headquarters survey team consisting of Clark Simpson, Fred West and James Mays spent three weeks in Panama and Puerto Rico obtaining information needed to permit a smooth take-over of audit functions. General Williams and Laurence Acker attended the opening interview in Panama.

March 1955

In our Staff Memos, staff conferences, and personal interviews, we point out our interest in each staff member, military and civilian. Also, throughout our operations we are emphasizing the importance of rotation between jobs. We want as

nearly as possible every man to have experience in all possible fields. This will make him more useful and at the same time will place him in a position for any promotion which may come his way. We are determined that the Army Audit Agency career program will make this Agency attractive to the best qualified audit personnel in the country.

We are not satisfied, however, with merely recruiting such staff. We are determined that they shall be afforded the type of opportunity while here that will retain them on the job. We also want to make the Audit life of our Army men so interesting and worthwhile that they will continue with us as civilians when their "hitch" is up. Prior to their release date, our Commanding General addresses a personal letter to each military auditor, inviting him to stay as a Civil Service appointment. One of our Corporals passed the Virginia C.P.A. with the highest grade in the State, taking the gold medal. Our training and guidance to staff is making its mark.

Armed Forces Personnel Establish Own National Writer's Organization

There is a new National organization of service connected writers who stand ready to give a helping hand to service personnel (including dependents) who are free lance writers or who would like to break into print.

The Armed Forces Writer's League, which was started in Hawaii about two years ago, is now expanding its National organization. Branches are being established near most major military areas in the U.S. and overseas and there is also being offered a member-at-large status for interested persons who are remotely located or who wish to assist with organizing a branch in their areas.

The League has as its special mission the promoting of writing and illustrating for publication by members of the Armed Forces and others associated with the Armed Forces, and the assisting of such members in producing and selling their materials. Membership at one dollar a year or ten dollars for life is available to all members of the Armed Forces, active or retired.

VANGUARD Essay Contest Announced By Martin

A VANGUARD Satellite Essay Contest with prizes and awards totaling \$24,000 has been announced by the Martin Company, Baltimore, Md., prime contractor and designer of the earth satellite launching vehicle which will attempt to place the earth satellite in orbit during the International Geophysical Year—July 1, 1957 to December 31, 1958.

The Martin Company is offering ten prizes totaling \$12,000—plus duplicate awards to the accredited institutions sponsoring winning papers. Eligibility to enter the contest is confined to seniors and graduate students majoring in Engineering or the Sciences at participating educational institutions.

Bendix Aviation Acquires Interest In Canadian Firm

Bendix Aviation Corporation has purchased a 40 per cent interest in Computing Devices of Canada Limited, of Ottawa. The purchase agreement, handled through Bendix Canadian subsidiary, Bendix-Eclipse of Canada Limited, includes a sales and licensing agreement under which the Ottawa firm will handle numerous Bendix electronic products and missile components and will exchange engineering developments.

The Bendix-CDC arrangement covers missile components of all kinds, telemetering, radio communication equipment, mobile radio and several new Bendix electronic developments for industry such as the Lumicon light-amplifying device, the mass spectrometer, nuclear and dosimeter gauges and meteorological equipment.

Bendix officials pointed out that CDC has been an outstanding leader in Canada in the electronic computer field, and said the Corporation would make available its computer products and developments to the Canadian firm.

- The Arkansas Traveler had nothing on American soldiers in Europe. Touring accounts for much of their off-duty time, and more than 66,000 automobiles are registered in their names.

ON CAPITOL HILL— with Fred Lardner



ARMED FORCES MANAGEMENT takes pleasure in announcing the appointment of Mr. Fred W. Lardner of Washington, D. C., as the new "Legislative Editor."

Each month beginning January 1957, Mr. Lardner will bring you

the latest news from "Capitol Hill" on that military legislation most affecting you and your organization.

Mr. Lardner brings to the staff a wealth of experience in this field. Beginning with a background in military service, he has been active in the publication world since 1933.

Fred Lardner has for many years been noted for his abilities to accurately report the happenings in our Nation's Capitol. His keen sense of military organization will be reflected in this new Department.

Management Briefs from the Services

Naval Air Test Center, Patuxent River, Maryland. A Safe Driving School designed for delinquent drivers has been paying dividends according to its director Art Lohse, Patuxent Safety Engineer. The school operates for a three week period with attendance required for the two hour periods held twice weekly. Graduates have been involved in very few accidents since inception over two years ago.

Marine Corps Base, Camp Pendleton, California. The 11th Marines recently dedicated their newly-completed chapel, Saint Barbara—in the name of the patron saint of artillery—at services held last month. The services of dedication were attended by large groups from the base befitting the 1600-year-old Saint who now lends her name to the chapel of a modern artillery regiment.

Hill Air Force Base, Utah. Dedication ceremonies were held last month for a new \$4-million super runway at this installation. Approximately 10,000 visitors witnessed the opening by Brigadier General

P. H. Robey, USAF, Ogden Air Materiel Area Commander of the new 13,500 foot airstrip, third longest in the United States. Highlight of the air show was a display of aerial fireworks by the famed "Thunderbirds", acrobatic flying team, who for 25 minutes held the crowd in the palms of their hands with intricate aerial gymnastics.

Army Chemical Center, Maryland. A novel idea was recently revealed at this installation to save tires on vehicles blocked in storage from the elements. The Chemical Corps solved this problem by spraying the tires with a coating of adhering plastic which is dark green in color and can be stripped from the tire at any time with a minimum of effort. The "strip-pable" coating, as it is called will protect tires in outdoor storage for five years. The plastic paint forms a seal which overlaps from the tire onto the rim which protects both tire and tube.

Offutt Air Force Base, Nebraska. Fiscal year 1956 ended at Offutt with an all time high for manage-

ARMED FORCES MANAGEMENT

ment improvement suggestions. Cash awards to military personnel amounted to almost \$5000 reports Major Thomas F. Barron, Manpower and Utilization Officer. SAC recently accepted the Air Staff Plaque for topping all other major commands with a 43.17 percent participation rate in the civilian suggestion program during the fiscal year. Whiteman Air Force Base, Mo., ranked as the top base in the entire Air Force with a 377 percent participation rate or almost four suggestions per civilian at the installation.

Headquarters First Army, Governors Island, New York. Colonel Henry H. Wild, First Army Adjutant General, together with Colonel Robert E. Benjamin, Comptroller and Chairman of the First Army Incentive Awards Committee, recently presented two members of the AG Section with awards. Mr. Lyman Merdin was the recipient of a Superior Performance Certificate and \$300 for his accomplishments in the First Army Publications Division. Mr. Hyman Rapfogel, received his fifth Department of the Army Suggestion Certificate and \$95 for suggesting a method of simplifying correspondence procedures which will save the Government approximately \$2700 a year.

Management Scientists Meet in Los Angeles

Furthering their program "to identify, extend and unify scientific knowledge that contributes to the understanding and practice of management," more than 300 scientists and management men were assembled recently for the Third Annual International Meeting of the Institute of Management Sciences.

Outstanding national and international figures from both the physical science and social science fields, as well as from business and industrial management, exchanged information regarding their progress in applying the latest advances in science to the management of industry, commerce and government.

Such phrases as linear programming, computer applications in

The Electronics Supply Office, Great Lakes, Illinois. Colorful ceremonies were held last month in celebration of the Tenth Anniversary of the Electronics Supply Office. Attended by 1450 civilian and military employees, Captain Portus D. Boyce, USN, acting commander in the absence of Captain Leland P. Kimball, Jr., delivered the keynote speech, "Our Tenth Anniversary". A huge cake, sliced with the Captain's glittering dress sword, was served at the reception.

University of Southern California, Los Angeles, California. Sixteen Army aviators are attending the eight-week course in aviation safety offered at the University. Seventy-eight Army pilots will have taken the course by next July. The program is similar to the one taught Air Force and Navy pilots since 1952.

Suffolk County Air Force Base, Long Island, New York. Eleven men were graduated recently from a 50-hour course for Air Force Supervisors. Colonel James H. Hancock, USAF, Base Commander, in a graduation address congratulated the class and urged each to return to his department with raised sights in base management.

Detroit Arsenal, Center Line,

decision making, mathematical models for inventory control—descriptive of management tools of tomorrow—filled the air. Adding a capacity for judgment to the functioning of "electronic brains," or computers through refinement of "memory" devices foretells an era of robot functions in business management. But progress in keeping such developments attune to human motivations and reactions—the area of behavioral sciences—moves side by side with these technological considerations.

Morning and afternoon sessions during the two days conclave featured the presentation of more than 45 technical papers by representatives from some of the nation's largest industrial firms, from the military, from leading academic and research institutions, as well as from similar organizations in Europe.

Michigan. Mr. Rudolph Dunec and Mr. Raymond Pulk were recently present with an award of \$100 for a suggestion concerning the offer of off-duty facilities of the Radiation Laboratory of the Detroit Arsenal to the Cancer Research Foundation on a non-profit basis, which has been adopted at the Arsenal.

Naval Supply Depot, San Diego, California. Eight employees of the Naval Supply Depot, San Diego received Superior Accomplishment Awards totaling \$1410.00. Performance, loyalty, devotion to duty, and production over and above the normal requirements of their positions, served as the basis for the majority of awards.

One award of \$150.00 recognized an estimated savings to the Government of \$4,000.00 when Theron C. Lake, NSD Fuel Division Foreman, volunteered to change the angle of six sub-surface nozzles in low flash storage tanks. Funds were not available to call in outside help.

In addition to Superior Accomplishment Awards of \$200.00, two

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employees, Mrs. Jean Hollowell, Statistical Assistant, and Mrs. Sara Ellis, Fiscal Accounting Clerk, received Outstanding Performance ratings.

Others rewarded were: Clarence Garrison, Stockman, \$160.00; Carl A. Magnuson, Engineman, \$200.00; George F. K. Buss, Rigger, \$200.00; Harmon McKinney, Organization and Methods Examiner, \$200.00; and Mrs. Lona Koppel, Military Personnel Clerk, \$100.00.

Williams Air Operating Facility, Antarctica. The arrival of the U.S. Navy's Task Force 43 "summer group" last month signaled the beginning of actual construction of the first base ever to be built at the South Pole. The base will be manned by U.S. scientists during the International Geophysical Year. An auxiliary air base is being constructed near the base of Beardmore Glacier, to serve as an aircraft refueling site and an important navigational aid center. The sub-base will be under the command of Lieutenant Noel D. Eichorn, USN,

Williams is under the command of Lt. Commander David W. Canham, USN.

Engineer Research and Development Laboratories, Fort Belvoir, Virginia. A jeep-mounted detector which automatically stops the vehicle when it locates a land mine has been developed by the Laboratory. Capable of finding mines buried in and along roadways, the detector covers a path six feet wide directly in front of the jeep and can be moved to both sides of the vehicle with ease.

Fifth Coast Guard District, Norfolk, Virginia. With the completion of the new \$4-million Federal Office Building in Portsmouth, Virginia, it is planned to consolidate District headquarters in this city. The Treasury Department has requested 41,000 square feet of space in the new building to house their organization.

USS Darter, Groton, Connecticut. Commissioning ceremonies were held on October 20th and colors hoisted for the first time on board the Navy's new attack submarine, the USS DARTER. Boasting an underwater speed equivalent to the surface speed of her World War II namesake, the new DARTER was placed in commission by Rear Admiral Milton E. Miles, USN, Commandant of the Third Naval District.

Wright-Patterson Air Force Base, Ohio. General Paul Bailly, Chief of Staff, French Air Force, with three other French officers were recent visitors at the base. Welcomed by General E. W. Rawlings and briefed on AMC activities by Major General Paul E. Ruestow, Director of Personnel and Support Operations, Major General M. D. Burnside, Director of Maintenance Engineering, and Major General F. J. Dau, Director of Supply, the two-day visit was climaxed with a UNIVAC demonstration.

United States Naval Academy, Annapolis, Maryland. Rear Admiral W. R. Smedberg, III, Superintendent of the U.S. Naval Academy has recently announced the

establishment of a "Superintendent's List" to stimulate interest and competition in academics and performance among Academy Midshipmen. Similar to the Dean's list at many colleges and universities, it is more difficult to achieve, but those making the list will be granted special privileges commensurate with their class.

Headquarters 1st Infantry Division, Fort Riley, Kansas. Exercise RED ARROW, involving some 14,000 Army troops, is presently underway at Fort Riley. Troops participating are from the 1st Infantry Division and other selected smaller units from the Continental Army Command throughout the United States.

Charleston Air Force Base, North Carolina. The maintenance control room operations board constructed by M/Sgt. John J. Ambrose, USAF, and reported previously in ARMED FORCES MANAGEMENT, is being utilized now by the 1611th Air Transport Wing at McGuire Air Force Base, New Jersey. The control console allows supervisors to tell at a glance where technicians are being utilized and the status of each aircraft in for repair. Plans for construction may be yours by writing the 1608th Field Maintenance Squadron at Charleston AFB, N.C.

Fort Benning, Georgia. Incentive award suggestions adopted at the Infantry Center during the 1956 fiscal year have saved more than \$150,000. Fort Benning, long a leader in the suggestion award program, have been recognized by the Department of the Army as being one of their outstanding installations. A recent winner in the program was Andrew J. Whittington, who collected \$200 for a tool designed to facilitate installing and removing bearing retainer rings in the hydraulic transmissions of the M-133 two and one-half ton truck and M-59 personnel carrier. Previously, a second mechanic was required to hold the rings during installation or removal.

Norfolk Naval Shipyard, Portsmouth, Virginia. First-year savings of \$11,350 will be realized from

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the 82 suggestions received last month. Cash totaling \$1,390 was paid to shop and office employees. High award of the month went to Joseph E. Brown, who received \$100 for suggesting a new method of procurement of oxygen analyzers.

Myrtle Beach Air Force Base, South Carolina. Colonel Francis S. Gabreski, USAF, base commander, has announced that the base will be operational on 7 December. Expected to arrive for the ceremonies are General Weyland, TAC Commander, Major General Timberlake, Ninth AF Commander, Governor George B. Timmerman of South Carolina and many local dignitaries. The celebration will begin with the arrival of the first two F-100 Super Saber jets assigned to the base.

Utah General Depot, Ogden, Utah. Utah General Depot employee suggestion and superior accomplishment awards for the 12-month period ending 30 June 1956 totaled \$17,025, making the Depot the top-ranking installation among 17 Quartermaster depots in the nation. The Depot also led in the percentage of adoption of suggestions, with 36.44 per cent adoption for every 100 employees. Total money paid for adoption was \$6,925, which averaged \$42.22 per civilian employee. An estimated \$119,539.83 was derived by the Federal government as beneficial savings, with an average of \$711.55 per adopted suggestion.

Eeilson Air Force Base, Alaska. The first C-130 Hercules to be used for Arctic testing was recently flown from the Lockheed Aircraft Corporation's Georgia Division plant to the Wright Air Development Command in Dayton, Ohio, and completely equipped for cold weather instrumentation. The new cold-weather laboratory was then flown to Eeilson AFB, the northernmost base where for the next 30-60 days a complete testing will be made under frigid Arctic conditions.

U. S. Naval Air Station, Whidbey Island, Oak Harbor, Washington. A new survival training tank, 65

feet long and 20 feet wide, complete with a "dunking" apparatus simulating the cockpit of a plane, is being constructed at the station. The new tank, enclosed by a building which is being constructed along with the tank, will give its trainee-occupants valuable training in escape techniques.

Headquarters Air Materiel Command, Wright-Patterson AFB, Ohio. General E. W. Rawlings, USAF, Commander AMC, recently presented Gerald D. Archdeacon with a scroll for the highest suggestion award — \$5000 — paid during the year. Given for his suggestion of a removable aircraft cargo deck, the award was the highest individual one given to an AMC employee.

Seattle Army Terminal, Seattle, Washington. The largest award ever given at the Seattle Army Terminal under the Suggestion Award Program, was presented last month to Donald W. Oldham. Colonel John B. Grinstead, Commanding Officer, presented the check for \$410 to Mr. Oldham for his new procedure in handling consolidated shipments of cargo containing resale items carried by through-bill carriers for the Army and Air Force commissaries in Alaska. Not only does the new procedure save \$36,870 yearly, it also reduces the import time from 5-20 days to 3-8 days, permitting stricter control over tonnage allocated to through bill of lading carriers in determining on which sailing shipments should be lifted. Seattle Army Terminal was recently cited as the leading Army Transportation Corps installation in the nation in the number of suggestions made under the Army's Incentive Awards Program.

U.S. Marine Corps Air Station, Cherry Point, North Carolina. The new Joint Reception Center opened last month, and a joint endeavor of the Air Station, the Second Marine Aircraft Wing and Force Aviation, is proving its worth facilitating the checking-in of every Marine reporting aboard the Base. Travel-weary personnel reporting to the base find a complete organization awaiting them on a 24-hour basis, to process their arrival and assist them in se-

curing both temporary and permanent housing. This morale-building idea is paying off at Cherry Point.

Armed Forces Institute of Pathology, Washington, D.C. The Medical Museum of the Armed Forces Institute of Pathology, Ninth Street and Independence Avenue, S.W., have on display a fabulous stamp collection on loan from Dr. Karl F. Meyer, M.D., noted medical investigator of the University of California.

Naval Air Station, Alameda, California. Beneficial suggestion awards amounting to \$1420 were recently presented to 44 air station employees. The ideas submitted will save the government \$33,034 annually. Top winner was Dick C. Rieder of the O & R Division who received \$265 for his idea on "rework procedure for Torque Meter Oil Seal Rings." The presentations were made by Captain J. L. Ewing, USN, O & R Officer.

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3. Protected pocket	Y	11. Pocket lug riding on rail	Y
4. Pocket tight to lug	Y	12. Frictionless shift of pockets	Y
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For more facts request No. 27 on reply card

NEW Dollar-Saving Products

INVESTMENT BROCHURE

Hamilton Management Corporation. Have you given much thought to the income cut you will take when you retire? Will your grocery bill, your clothing costs, your gas and oil, your rent all be cut in half just because your income is? Our library has a folder entitled, "You Can Retire on Your Terms," which points out how with even a few years of service remaining, you can substantially supplement your retirement income. It shows how a great deal can be accomplished with a small amount of money. A copy is yours, without obligation, by circling the attached reply card.

For more facts request No. 1 on reply card

FULL-KEYBOARD ADDING MACHINE

Monroe Calculating Company. "The fastest, quietest and sleekest full-keyboard adding machine ever produced," is the way the Monroe Calculating Machine Company describes the latest addition to its figuring line. Termed the "800," the machine is distinctively different in design from its predecessors. May we send you information on how this new machine can replace several older ones in your installation?

For more facts request No. 2 on reply card

WORLD LANGUAGE DICTIONARY

Britannica Publishing Company.

As a service to OPERATING DEPARTMENTS and PURCHASING OFFICERS, ARMED FORCES MANAGEMENT will provide you with a selected list of manufacturers' products.

How to Use Armed Forces Management's Library—

Inserted in this issue, a postage free card is provided for your convenience in requesting descriptive and informative literature. This will be forwarded to you, without obligation. Many cost saving ideas are generated by Operating Departments that have referenced information on products available. Purchasing Officials will find this type of information invaluable. All that need be done is: fill in name and address, circle that which will assist you, and drop in the mail.

Send for further information about the book demanded by service personnel for a simplified way to master a limited knowledge of the important languages of the western world. The American language comes to a new world prominence in this monumental new book. A "must" for those assigned or scheduled for overseas assignment.

For more facts request No. 3 on reply card

RUNWAY SWEEPER

Wayne Manufacturing Company. A vacuum sweeper capable of sucking up objects as large as 3-inch steel cylinders which operating down a runway at 25 miles per hour has recently been developed by this time-honored manufacturing organization. Now available to cut your maintenance costs from jet operations is this new machine equipped with a 10-foot vacuum nozzle pulling 2,000 times the suction power of a home vacuum sweeper. Information and specific details available without obligation.

For more facts request No. 4 on reply card

NEW SUB-FRACTIONAL HP MOTORS

Borg Equipment Division, The George W. Borg Corporation. An improved line of sub-fractional horsepower BORG-MOTORS for precision instruments has been announced as available. Offered in a range of from 1/2000 to 1/750

horsepower, the new rugged and dependable motors are available in both synchronous and induction types, with or without gear trains. Literature and complete engineering data is available for your review.

For more facts request No. 5 on reply card

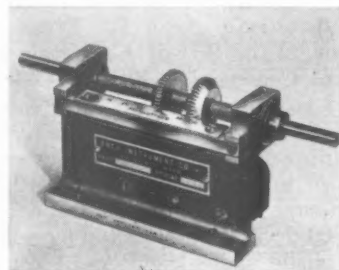
MANAGEMENT AND RECORDS CONTROL BROCHURE

Remington Rand Corporation. How the Armed Forces and industry can decrease operating costs and achieve greater profits and savings is told in a new eight-page illustrated booklet published by Remington Rand. Entitled "These White Elephants are Made of Paper," the publication outlines various methods of improving management and records control. The first step in establishing records control and cutting down the size of this white elephant is an inventory and appraisal of all existing records, and the setting up of a Retention Schedule. This is followed by a detailed analysis and reorganization of filing systems and procedure and the selection of proper equipment for both administrative and operating personnel. Copies of this booklet, BSD 45, are available to you without obligation.

For more facts request No. 6 on reply card

CLOSE-TOLERANCE LIMIT SWITCH

Arch Instrument Company. (See cut). Rapid, precise adjustment to close operating tolerances, and excellent repeatability in high-speed or low-speed operation are features of the Arch limit switch Model LS-1. Exact limitation of rotary motion is assured by the use of two



cams that are driven along a rotating lead-screw to actuate two SPDT precision snap-acting switches. The lead-screw is connected to the sys-

ARMED FORCES MANAGEMENT

tem to be controlled by suitable gears. Adjustability of 1 part in 3400 (.03% of the full range), and repeatability of plus or minus 5 degrees of a 360 degree revolution of the lead-screw (.04%) are features of the unit; the limit of travel for cams is from 1 to 70 turns of the lead screw. Complete and more detailed specifications and information will be sent you on request.

For more facts request No. 7 on reply card

SNOW REMOVAL PROBLEMS

Allis-Chalmers Manufacturing Company. A new mailing piece (MS-1147) "DO YOU REMEMBER?" which deals with the time and dollar problem of snow removal has recently been made available. We thought you might be interested in having a copy without cost, especially in view of the forthcoming winter season.

For more facts request No. 8 on reply card

POCKET-SIZE TAPE RECORDER

Mohawk Business Machines Corporation. The new MOHAWK MIDGETAPE, weighing only 2½ pounds and measuring 1½" x 3½" x 8½", is a boon to traveling officials and field commanders. Reasonably priced, this longlife miniature recorder is ideal for the military. Complete descriptive information without obligation.

For more facts request No. 9 on reply card

RECREATIONAL EQUIPMENT

Battle Creek Equipment Company. Many items of exercise, health and therapeutic equipment, including sun lamps, are illustrated and described in a new 36-page catalog of products manufactured by the Battle Creek Equipment Company. Items include several types of rowing and bicycle exercisers, a stationary walker, heavy-duty vibratory massage units, and other appliances. We will be pleased to send you catalog number 22 upon request.

For more facts request No. 10 on reply card

VACUUM-BREAKER BACKCHECK VALVE

Hercules Plastics Corporation. This new invention by the Hercules Plastics Corporation allows you to buy \$100 worth of insurance for \$1.50. Designed specifically for use

with all hose attached appliances, the new valve protects home and community water supply systems from pollution at moments of water pressure failure which create a vacuum, drawing the contents of service pipe lines and appliances hose attached thereto, back into the storage facilities and/or water mains. This new valve stops this backward flow. Weighing only ½ ounce and equipped with a standard hose thread, this will be an important asset to base and station engineers. Complete information is available from our library.

For more facts request No. 11 on reply card

NAVIGATIONAL FLIGHT SIMULATOR

Reflectone Corporation. Recently the new navigational flight simulator (the N-3) developed in conjunction with the Air Force made its debut in Stamford, Connecticut. The Trainer provides for 13 navigator-students to be trained simultaneously in a series of identical booths which contain all the equipment with which the navigator would be faced when in flight. The 13 booths are controlled by an instructor-operator from a central console, through which he can set up an infinite variety of conditions for each trainee. More descriptive information and specifications are available without obligation.

For more facts request No. 12 on reply card

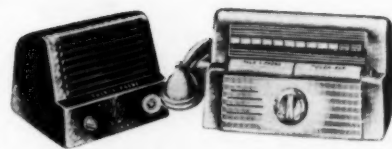
BULLETIN BOARDS

Arlington Aluminum Company. Do you have a communications problem? If your organization rated on the method of keeping and neatness of your bulletin board? This common problem can be solved for only a few dollars. Combining the best features of bulletin boards and poster frames, the new Arlington Aluminum three-panel bulletin board is framed in long-lasting polished aluminum. Bulletins are easily attached to the black peg-board with snap rivets. Each panel is 17" x 22", and designed for sturdy maintenance-free use. May we send you descriptive information without cost?

For more facts request No. 13 on reply card

NEW TALK-A-PHONE

The Talk-a-Phone Company. (See cut). Automatic Voice Control



that does away with the need for manually operating any controls during conversation, yet permits private and selective communication, is featured in the new Super Chief Automation Series 7700 Talk-A-Phone. Dynasonic design; Multi-Magic Selector and Uni-Trans, all exclusive Talk-A-Phone features, are included in the new low-priced Super Chief series. Complete data on this new equipment is available without obligation.

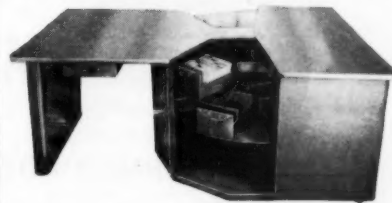
For more facts request No. 14 on reply card

NEW "PAYLOADER" TRACTOR-SHOVELS

The Frank G. Hough Company. Two new four-wheel-drive, pneumatic-tired "PAYLOADER" tractor-shovels have been announced and are in full production. These are the model HH with a payload



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For more facts request No. 33 on reply card

capacity of 1½ cubic yards—1½ cubic yards struck; and the model HU with a payload capacity of 1½ cubic yards and 1 cubic yard struck. Numerous new features have been incorporated in the design of both of these new units including the new Hough "PAYLOMATIC" power-shift transmission. The necessity of coming to a stop for a "range-shift" is completely eliminated with this new "no-stop" transmission since all shifts in both forward and reverse can be made without even slowing down. The finger-tip directional control can be operated under full engine speed, in any gear. Complete specifications and literature on both the HU and HH models is available to you.

For more facts request No. 15 on reply card

PORTABLE LAPDESK

Thompson Manufacturing Company. Here is a new product designed for military personnel and others who have occasion to write, draw or figure while sitting or

standing, without benefit of desk or table. It is light, portable, compact, ruggedly made of ½ tempered masonite 14 x 11 inches. The nickel plated bracket can be adjusted at any desired angle and formed to fit the leg above the knee. So low in price its amazing, we know you will want one for each organization as a part of both field and administrative equipment. Complete prices and specifications are available without cost.

For more facts request No. 16 on reply card

AO MICRO OPAQUE READER

American Optical Company, Instrument Division. The AO Micro Opaque Reader has been designed as one of the most versatile, efficient high speed readers ever produced, and it will accept every known type of card with micro data on it. Since there is a marked trend in thousands of military installations, libraries, businesses and industries to convert bulky, voluminous records to micro data—of necessity

—the new reader has an enormous potential. Detailed specifications, price lists and uses will be forwarded to you immediately without obligation.

For more facts request No. 17 on reply card

TWOBOY RETRIEVER

H. S. Watson Company. Conversion of a pick-up truck into a low cost automobile towing vehicle is now possible with the Watson Towboy. Easily mounted or removed from a pick-up truck, it can handle the majority of service calls now done by heavier and more expensive equipment. Moreover, the Towboy has a simple extension boom for portable crane use. The Towboy is hand winch-operated with a 2-ton lifting capacity. Only two minutes are required to make the simple solid hook-up. An exclusive new type of cushioned coupling prevents damage to towed vehicles. No longer is it necessary in these days of utilization justification to have a low-use wrecker on your records. A free catalog and practical towing booklet entitled "Put Your TOWBOY to Work," is available to you.

For more facts request No. 18 on reply card

REPLACEMENT PARTS

Hardman Tool & Engineering Company. Two replacement parts applicable to Pratt & Whitney 2800 C. B. series engine, an exhaust support bracket and a front intake pipe shroud assembly for installation on DC-6 and Convair 340-440 aircraft are now available. Both parts have been rigorously tested in actual flight operations by United Air Lines and its entire fleet are now equipped with these parts where applicable. The exhaust support bracket, part No. 3604 which replaces P & W Part No. 4395388 R. Y. A., in addition to a far superior life expectancy, helps to cut maintenance costs. It can be replaced in 20 minutes without removing the exhaust pipe. The intake pipe shroud, Part No. 4105, replaces P & W Part No. 84702. It is made of low carbon steel instead of dural and is brazed rather than bolted onto the standoff brackets, Part No. 4106, and a special shroud positioning block, Part No. 4107. The assembly is greatly improved in service life.



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For more facts request No. 19 on reply card

NEW CATALOG OF VALUES

Equipto, Division of Aurora Equipment Company. A completely new reference manual for steel equipment No. 485 has recently been published by Equipto. Specifications of their complete line of Shelving, Bins, Drawer Units, Lockers, Benches, Counters, and Trucks, are included in this catalog for your files. More than 50 years of progress was recently completed by this time-honored organization designed to bring you low-cost durable equipment. Copies are available without cost to interested individuals and organizations.

For more facts request No. 20 on reply card

UNDERWATER METAL LOCATOR

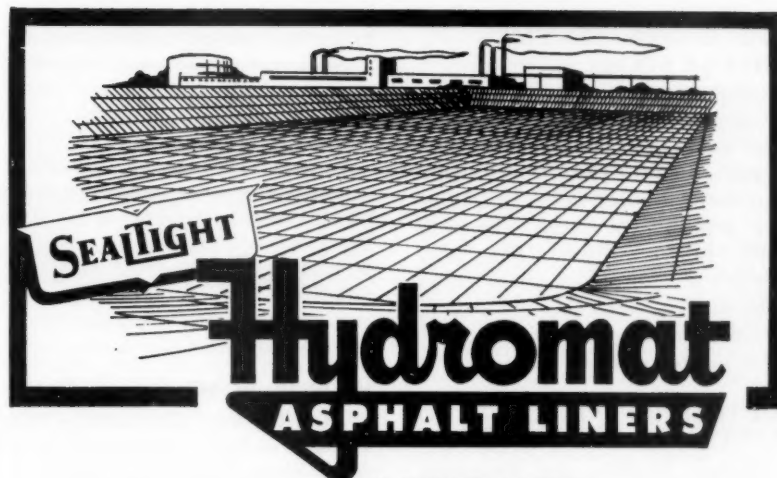
Bludworth Marine, Division of Kearfott Company. A cannon lying under five feet of mud off Port Royal, British West Indies, where it sank in 1622, was recently located by means of Bludworth Marine's Underwater Metal Locator. With a weight of only 1½ pounds when submerged and easily handled by a diver using swim fins, this new locator now being used extensively by the U. S. Navy and other governmental departments is within the cost range of your organization. More specific information is available upon request.

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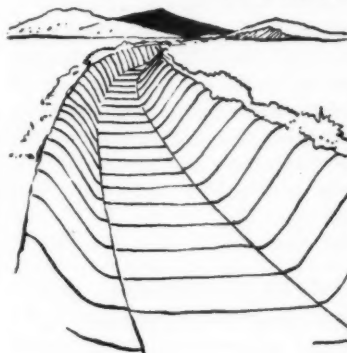
GLU-PEN

Glue-Pen Corporation. Would you like to have the usefulness of glue with the convenience and neatness of a pencil? Such is now possible with the new GLU-PEN which sells for little more than one dollar. Does your office storeroom, like so many, contain bottles of unused issue glue? Designed for everyone who puts things together, this new and novel invention will answer your problems. Always ready, dependable, convenient and giving instant, permanent adhesion, the glue will not soil hands, paper or office furniture. Circle the product card NOW for immediate detailed information.

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breaking the seal. "Hydromat", a fully exposed type of lining, may be installed quickly and easily by untrained labor ... make-ready requires only a minimum of time and effort. "Hydromat" provides the practical answer to the problem of efficiently relining old, cracked concrete or gunite linings. "Hydromat" hydraulic mats are produced in sheet sizes 4' wide up to 12' long ... available in thicknesses of 5/32", 1/4" and 1/2".



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For more facts request No. 34 on reply card

BELCO REPLACEMENT FAUCET STEMS

Miller Manufacturing Company. Leaking compression type faucets, lost water and excessive maintenance costs are gone forever with the installation of Belco ball bearing replacement stems, complete with bibb washers. The bibb washer is only under compression and is not subject to cutting or grinding action.

For more facts request No. 23 on reply card

MUTUAL INVESTMENT FUND FACTS

Brown, Madeira, and Company. This company, specializing in mutual investment funds, will send, without obligation, facts about conservative, middle-of-the-road, and aggressive types of investments and mutual funds.

For more facts request No. 24 on reply card

VISUAL CONTROL BOARD

Wassell Organization, Inc. Production not only schedules but automatically checks with time, line, and color control, has low original and upkeep cost.

For more facts request No. 25 on reply card

COMMON STOCK INVESTMENT

Hamilton Management Corp. Through Hamilton Funds, Inc., a managed common stock investment fund, this firm offers lump sum or monthly investment plans to fit any budget. Interested persons can inquire without obligation. Firm recently declared another quarterly dividend.

For more facts request No. 26 on reply card

VISIBLE EQUIPMENT

Wassell Organization, Inc. There are 16 good reasons why you should be cutting costs and speeding efficiency with Sig-Na-Lok. In use in all branches of the government, it should be investigated before you buy anything less.

For more facts request No. 27 on reply card

VISUAL MANAGEMENT CONTROL

Graphic Systems. This New York firm invites men interested in efficient management to get things done with Boardmaster Visual control which gives a graphic picture of operations, spotlighted in color,

saves time, money, and stops errors.

For more facts request No. 28 on reply card

SELF INDEXING CARD SYSTEM

Wassell Organization, Inc. First again by Wassell, Plas-ta-card Self-Guides are the boon of all tabulating folk. Self-Guides go through tabulating machines, no guides to remove or replace, makes tab cards as fast as the fastest card file.

For more facts request No. 29 on reply card

INCOME FUND

The Keystone Company. This leading eastern investment firm offers Series K-1, a diversified investment in securities selected for current income.

For more facts request No. 30 on reply card

FILING CABINETS

Wassell Organizations, Inc. Cut your office force filing time in half, save up to 40% in space with Corres-File. Revolutionary filing equipment takes your file clerk out of the laboring class and saves you 50 cents of every dollar you now spend.

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QUALITY FASTENERS

Rockford Screw Products Co. A famous name offers the complete line of quality fasteners, screws, studs, pins, and bolts to fit any need plus engineering experience for specials of all configurations.

For more facts request No. 32 on reply card

CORRES-FILE ORDER DESKS

Wassell Organization, Inc. These New Order Desks give finger tip control of all records. Cards and correspondence or orders can be mixed. All records instantly available.

For more facts request No. 33 on reply card

ASPHALT LINERS

W. R. Meadows, Inc. Sealtight Hydromat asphalt liners insure the complete containment of water, wastes, sludges and sewerage in industrial reservoirs and waste control ponds, military installations, irrigation projects. It's mechanically sealed joints will expand and contract with soil movements without rupturing or breaking the seal. Available in the sheet size to fit your construction plan best.

For more facts request No. 34 on reply card

SPRING-DEX CARD FILES

Wassell Organizations, Inc. Cut clerical costs in half on present records without expensive transfer. Revolutionize your present records. Make them visible, efficient, time and dollar saving. Spring-Dex is easy to install on any card in any housing.

For more facts request No. 35 on reply card

Traffic Agency Assumes Freight Functions

WASHINGTON, D.C.—Effective November 1, rate negotiation and freight classification functions now performed by the Navy's Bureau of Supplies and Accounts were transferred to the newly-formed Military Traffic Management Agency, Washington, D.C.

On and after that date all communications relating to adjustment of freight rates, establishment or adjustments of freight classification descriptions, ratings and Section 22 quotations should be addressed to the new agency. The full mailing address for inquiries of this nature is: Executive Director, Military Traffic Management Agency, Building T-7, Washington 25, D.C.

Until new Agency regulations are issued, applicable Navy directives and procedures will remain in effect, but full authority and responsibility for action will be assumed by MTMA.

Col. Bare Assigned To PX Headquarters

Lt. Colonel Harold F. Bare, USAF, has been assigned as Special Assistant to the Deputy for Operations at the New York Headquarters of the Army and Air Force Exchange Service, it was announced recently by Major General H. L. Peckham, Exchange Service Chief.

Colonel Bare comes to his new assignment from San Francisco where he was Deputy Regional Officer. He has been in exchange work for many years, and he has served as staff exchange officer for the headquarters of Strategic Air Command in Omaha, Nebraska. During World War II Colonel Bare served with the 8th Air Force in Europe as exchange officer, company commander and Quartermaster and Executive Officer.

● American Can Company, New York City, is taking office employees from its headquarters for small-group visits to operation sites in Brooklyn and Jersey City. More

accurate and understanding use of company terms will be one benefit, more interest in company operations, another, executives are convinced. *Dun's Review and Modern Industry.*



Book Reviews

by D. D. Corrigan

CHRISTMAS GIFTS

Each review this month has been carefully planned to describe and recommend books that would be appropriate for giving at Christmas time. The topics range from an all inclusive seven language dictionary to a hilariously funny book. The life of an executive is explored and two records of military music are reviewed. Several outstanding books of 1956 are noted. See page 47 for how you can order the records, these books and other books through **ARMED FORCES MANAGEMENT.**

The Man in the Ivory Tower "THE EXECUTIVE LIFE," by the Editors of Fortune (Doubleday, 223 pages, \$3.50).

The very word "executive" is hard to define. Foreman, manager, supervisor, director, are titles easily identified, but are often thought to be synonymous with the term executive. The authors are of the opinion that the true executive comprises a small group of men at the very top of a company. The Editors of Fortune magazine are reporting what an executive does and why in their penetrating book, "The Executive Life." They found there is no established pattern or set formula, but a complex mode of life. While each executive is an individual, they face similar problems and techniques. From a survey it was learned what the majority of the top echelon feels defines an executive. These findings present a composite picture.

"An American executive is a person paid for a full-time job in which he: (1) directly helps to set his company's objectives and overall policies; (2) is required to make or approve decisions that significantly affect profits and future plans; (3) coordinates several major corporate functions, or those of

a major division or department; (4) maintains and develops an organization of trained subordinates to achieve the company's objectives, and (5) delegates responsibility and authority to the organization, and controls performance and results through at least one level of supervision."

An investigation was made of the background and characteristics of executives. Where do they come from, what is their compensation, what is their age, how long have they been with the company, what is their education, what was their father's occupation? The results show that the average top man was born in the middle west, son of a businessman, had a college education, worked for at least one other company, is today between fifty and sixty, and receives \$70,000 to \$80,000 a year.

Reports also disclosed that most top men will change jobs if the opportunity is presented to them, but when forced to resign or voluntarily seek a new position, they do not have an easy time of it. Inexperience in job seeking adds to the difficulty of finding a suitable and desirable position.

The theory that top salaried men have not the incentive to work hard because of high taxes is debunked. Executives are working as hard as ever, and tension, drives, and pressures are counter-balanced by self-expressions of ambitions, prestige, and responsibilities. However, it is pointed out that executives do not crack up because of over-work, but breakdowns occur when "a neurotic individual encounters in his work a special stress that at some point unbearably intensifies the conflicts in his own personality; then he goes to pieces."

Decentralizing authority and responsibility has resulted in a new attitude toward making decisions.

The role of the business vice president no longer means a man able to take over for the president of the company. Many companies now have many vice presidents, some as many as forty-six. Specialized duties mean that there is a new attitude toward vice presidents, with the result that the vice president is a new type of executive, with new impressions felt by the v.p. himself.

The true executive must make important decisions, and a lively discussion is held by the authors on how does the true executive make these decisions. What necessary steps must be taken? How does he evaluate information? Does chance play a leading role? These questions are all answered in the chapter, "How executives make decisions." The rest of the book is devoted to how to fire, retire, become an executive.

Military readers will be especially interested in a comparison between decision making in business and the scientific technique called "systems analysis" as studied at the Air Force's Rand Corporation.

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One For All, All For One

"BRITANNICA WORLD LANGUAGE DICTIONARY," (Funk & Wagnalls, two volumes, 2065 pages, \$35.00).

Here is one ideal Christmas present for everyone, and one that all should appreciate receiving. The student will treasure its completeness, the business executive the usefulness. Even the man in the gray flannel may find this book suits him best.

Last year a dinner was held at the Statler Hotel in Washington at which time seven hand-bound sets of the new dictionary were presented to the chief of each of the nations whose languages were used. One was given to the representatives of the White House and the embassies of England, France, Germany, Italy, Mexico, and Sweden. The world language dictionary is dedicated with permission to Dwight Eisenhower, Queen Elizabeth the Second, King Gustaf VI Adolf, Theodor Heuss, Rene Coty, Giovanni Gronchi, and Don Adolfo Ruiz Cortines.

Before this presentation, copies of the World Language Section were sent to 500 language scholars throughout the world, to ask their advice and suggestions for revisions. Their ideas were incorporated in the publication of the newest, most comprehensive dictionary ever printed.

While this is called a seven language dictionary, it should be explained that this is more than a foreign language dictionary. About three-fourths of this massive edition is concerned with just English. This is actually a Funk and Wagnalls standard dictionary of the English language. Each definition for Part I was examined by a staff of experts to obtain the greatest accuracy possible. No expense was spared to make this the most practical and complete guide to words ever produced.

Part II and Part III are the seven language sections, and were prepared under the direction of Walter Yust, Editor of the Encyclopaedia Britannica and John V. Dodge, Managing Editor.

Travel by service men and women stimulated the demand for such a book. It is not intended to make

the reader be able to speak fluently in seven languages, but is intended to convey an understanding of the most commonly used words in each language, based on a study of how frequently each word is used in each of the seven languages.

Part II begins with a basic list of English words and their equivalents in parallel columns in French, German, Italian, Swedish, Spanish and Yiddish. This means one simple line across a page enables the reader to find the translation of an English word into six other languages. An example of the line reads: "management" English, "direction" French, "leitung" German, "direzione" Italian, "direccion" Spanish, "ledning" Swedish, "onfirung" Yiddish.

The next portion, Part III, is in effect a reverse of this, listing the same words: French to English, Swedish to English, German to English, Italian to English, Spanish to English, and Yiddish to English.

Each of the foreign language sections includes simplified pronunciations of the foreign words; cardinal and ordinal numbers; days of the week, months of the year; equivalents of first names; phrases useful in greetings, asking directions, hotels and restaurants, telephoning, asking the time, discussing the weather, obtaining postal information, interpreting public signs; handling typical traveling situations aboard the train, bus or plane. Also a condensed grammar of each of the languages is printed, a valuable contribution.

Every home and every office should have a good dictionary, and why not the best? Britannica World Language Dictionary combines every known requirement for education, reference, and understanding, and is complete and practical.

Penting With Winston

"WINSTON IN WONDERLAND," by Major Winston M. Estes, United States Air Force (Eagle Press, \$3.50).

At first glance at the title I thought "Winston in Wonderland" was a fairy story, or a fantasy, or perhaps an escapade, an adventure, or a satire. In a way it is all of these

things, but above all it is FUNNY. The humor is not subtle nor liable to evoke small polite titters or a raised eyebrow with a half-smile. This is tears-down-the-face, twisted torso, rolling on the floor kind of humor that results in loud prolonged boisterous laughter.

Usually when someone tells me a certain book is very funny, somehow when I read it I fail to feel the same sensation. However, I do not hesitate to recommend this book for its direct impact of humor to members of the Armed Forces. What a wonderful country this is where a man can poke fun at an important department of the government. Major Estes is too clever to offend or be nasty, he is instead amused by certain rules and regulations and some human frailties.

As you may have guessed by now, this is the story of Major Winston Estes and his experiences on a tour of duty at the Pentagon. The reason for writing this book was that little Estes Jr. asked his Daddy what he did at the Pentagon. This started a chain reaction of wondering what he did do and why, and he decided to write down his activities and impressions.

Winston begins with a general description of the building and his first day spent in the labyrinth of corridors, leaving an image in his mind of doors and more doors. This image was soon replaced by a powerful impression of coffee cups. Winston finds that one of the most important matters on the agenda of each day is the coffee break. This ritual is strictly observed by everyone, and follows a set pattern from which no one deviates.

The place to be during the lunch hour is the Concourse, and this is where Winston first heard the standard kiss-off phrase, "I'll call you for lunch sometime." Pentagonese language also includes "name-dropping," which competes for popularity with the greeting, "When do you get out?"

The Major learned fast and furious about certain regulations and procedures and says, "I learned soon enough to bow to the inevitable and to coordinate within an inch of my life. I think that I can say with modesty that in my time I was considered one of the top coordinators in the Pentagon. It is al-

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most impossible to pin any error on me exclusively." He was not awarded the Purple Heart during this assignment, but he does feel that while many involved and numerous telephone conversations have left no permanent scars, he is a marked person for life. HOI is referred to as a do-it-yourself-kit, with emphasis on signature markers and the difficulty of getting along with and without initials.

Winston quotes the person who remarked that the parking facilities resembled the largest used car lot in the world, but the importance of the parking lot cannot be over-emphasized. To command the respect of everyone is to have an S-2 or S-3 parking permit. This takes precedence over all other coveted privileges.

Then there was the rumor about the officer who by mistake worked out an organization chart instead of the test paper. "He worked out the entire chart by algebraic equations. When the instructor called time, the officer had combined AFOOP, AFPDP, AFCAG-13, CPMN, and WROAAA. He neu-

tralized all deputies, executives, and policy-planning officers, and combined the primary mission of AFOIN with that of the Reception Desk at the River Entrance. Had the class hour not ended when it did, it is not impossible that the officer would have consolidated the entire organization of the Pentagon into one simple equation like OAGON."

May I leave you with this little thought for the day. "Winston reads good like a funny book should," or "You'll wonder where this Winston went when he finished this book about the Penta-gents."

For Your Listening Pleasure

"RUFFLES AND FLOURISHES," Music for Field Trumpets and Drums, Eastman Symphonic Wind Ensemble conducted by Frederick Fennell (Mercury Recording Corp. \$3.98).

"THE SPIRIT OF '76," Music for Fifes and Drums, Eastman Symphonic Wind Ensemble conducted by Frederick Fennell (Mercury Recording Corp. \$3.98).

Recently I had the pleasure of hearing two outstanding records that I thought would be of such great interest to members of the Armed Forces that I will depart for a moment from books.

Both of these are 33 $\frac{1}{3}$ r.p.m. high fidelity records based upon the Field Music of U.S. Armed Forces from the Revolutionary War to the present day. Each is a companion piece to the other. Recorded on these discs is more than just music, but actually a musical history of the early United States Army.

The cover of "The Spirit of '76," shows the famous painting by Archibald M. Willard. This picture depicts the beginning of military music in what later became the Republic of the U. S. of America. The Continental Army may have lacked fighting gear and a large array of musical instruments, but someone could always find a fife or drum to play, rousing the spirit of freedom seeking men and stirring enthusiasm.

Included from the Revolutionary War is "Yankee Doodle," from the Civil War, "Sergeant O'Leary" and "Dixie." Camp duty of the U.S. Army is vividly portrayed, and the colorful drum solos start the listener's foot tapping to the beat.

Music for field trumpets and drums as played in "Ruffles and Flourishes," is as direct and effective as music can be. Among the pieces will be found traditional marches and inspection pieces, music for rendering honors, bugle calls of the U. S. Army, drum solos, and a skillful rendition of the Star-Spangled Banner.

Both of these records are a stirring recollection of the past and present of military music. Here are two unique listening experiences.

Outstanding Books of 1956

"QUANTITATIVE MANPOWER ANALYSIS," by Cyrus A. Martin (Frederick Research Corp., 78 pages, \$2.00).

The author is a government manpower analyst and industrial engineer. This book is designed for manpower analysts, and can be read, studied and used by the technician who is concerned with the mathematics of work load and required manpower. Charts, tables,

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and examples point the way for manpower distribution. A framework is suggested for which procedures for time and motion study and other qualitative analysis may be planned and carried out. Applications of these principles will yield dividends to the diligent reader.

"SUCCESSFUL EXECUTIVE ACTION," by Edward C. Schleh (Prentice-Hall, 252 pages, \$10.00).

The sound executive philosophy of Mr. Schleh makes the material presented in this book of value to any executive coordinating the diversified parts of management to a common goal or objective.

"AMERICAN MILITARY POLICY: Its Development Since 1775," by C. J. Bernardo and Eugene H. Bacon. (Military Service Publishing Co., 512 pages, \$5.00).

For military persons this book is a must for understanding government activities. The need for a book such as this has been apparent for some time. Not too technical, nor too simple, but up to date and complete.

"THE STAFF ROLE IN MANAGEMENT," by Robert C. Sampson (Harper, 226 pages, \$4.00).

Expert advice on day-to-day activities that can be utilized in achieving effective management through proper understanding of the staff. A staff man is a collaborator and a counselor. His objectives should be development and planning.

"COMPANY ADMINISTRATION AND THE PERSONNEL SECTION," by Colonel C. M. Virtue (Military Service Publishing Company, 412 pages, \$4.50).

The 24th edition of a book that has served the army well. This new revision brings the unit administration and personnel management sections completely up to date.

In reply to several requests from our readers, **ARMED FORCES MANAGEMENT Library** will be pleased to forward you these or any books of your selection postpaid upon receipt of your check or money order.

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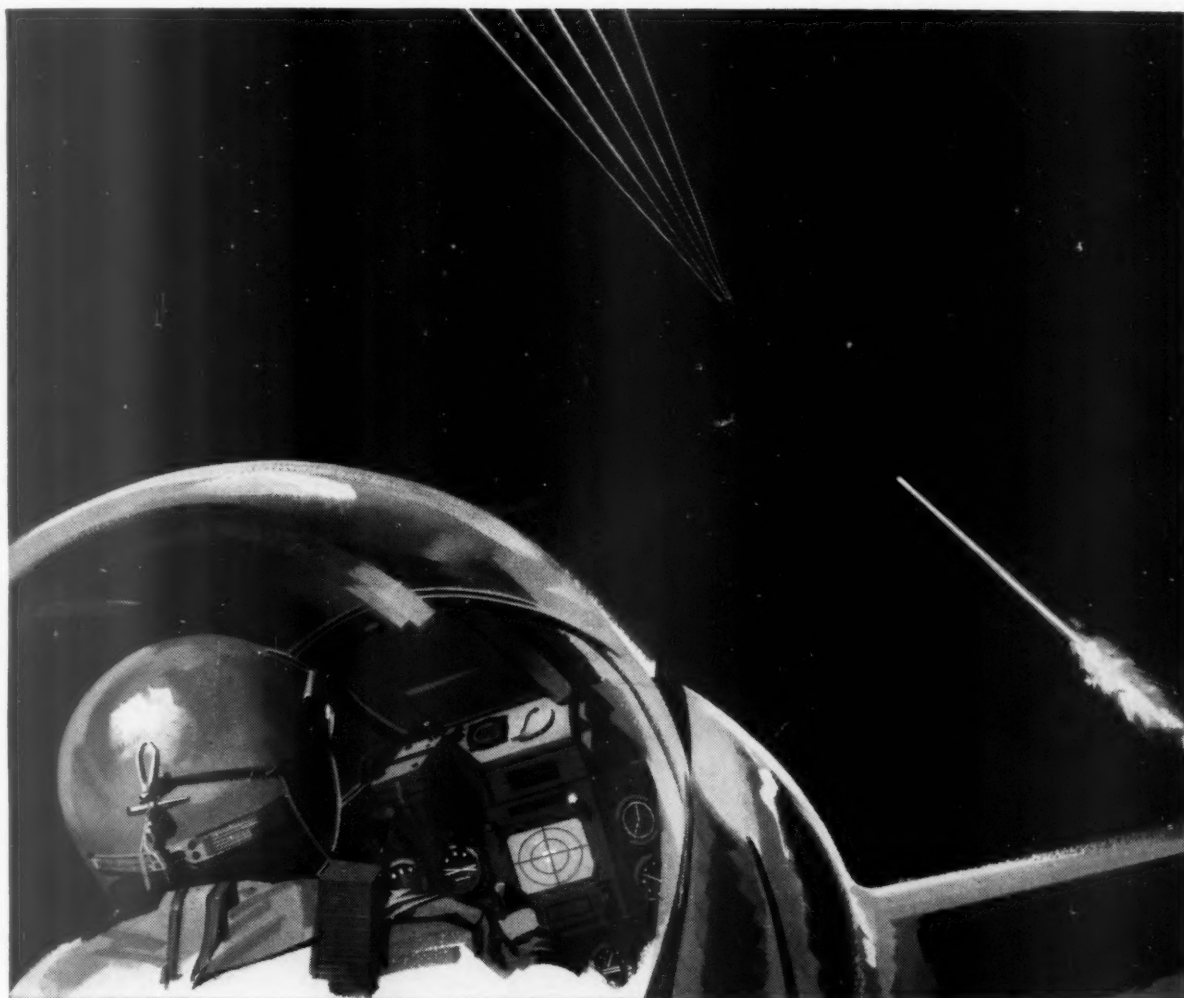
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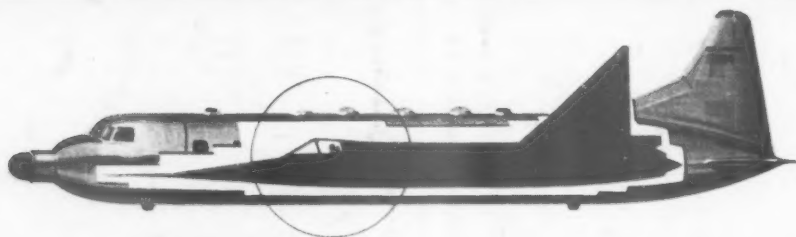
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